



OWNER'S MANUAL

- Assembly
- Installation
- Operation
- Repair Parts
- Maintenance Tips

Model No.

LWO-112 (Oil Fired)
LWG-112 (Gas Fired)
LWO-168 (Oil Fired)
LWG-168 (Gas Fired)

CAUTION:
Read Rules And
Instructions
Carefully For
Safe Operation

IMPORTANT: Installation must be made in accordance with NFPA, and state and local ordinances which may differ from this installation manual.



**Oil/Wood - Gas/Wood
Warm Air Central Heating Furnaces**



All furnaces in this owner's manual are
UL Listed in UL file #MH 11057

**FOR YOUR SAFETY:**

If you smell gas:

1. Open windows
2. Do not touch electrical switches
3. Extinguish any open flame
4. Immediately call your gas supplier

**FOR YOUR SAFETY:**

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

**RISK OF FIRE OR EXPLOSION**

Do not burn garbage, gasoline, drain oil, kerosene, thinners, etc.

**WARNING**
RISK OF FIRE

Tightly close the firing door and ash door during operation.



Do not operate with flue draft exceeding .03" W.C.



Do not store flammable materials within marked installation clearance.



Frequently inspect and clean soot and/or creosote from the heat exchanger, smoke pipe, and chimney.



Do not connect this unit to a chimney flue serving another appliance.

**BLACK SURFACES ARE HOT**

Keep children away. Do not touch.

Before installing this furnace, read and follow all instructions in this manual. It is recommended that a heating professional installs or supervises the entire installation of the furnace, ducts, chimney, electrical and gas or oil hook ups.

Questions?

**Visit www.yukon-eagle.com
or call**

1-800-358-0060

**For repair or replacement parts,
See back cover for details.**

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Safety Statements



STOP FOR SAFETY!

Safe assembly, operating and maintenance practices should always be followed whenever using any equipment. Wherever you see the caution sign, extra safety precautions should be taken.

You must stop, read, and carefully follow the safety instructions before proceeding.



READ THROUGH THE ENTIRE MANUAL

It is recommended to read through the entire manual before beginning your installation and/or operating your furnace. Follow all steps exactly.

UL LABEL AND NFPA PRACTICES

Areas of this manual refer to Underwriters Laboratories (UL) and the National Fire Protection Association (NFPA).

UL & NFPA are non-profit organizations. This furnace must be installed according to NFPA codes.

UL is the oldest and largest public safety testing laboratory in the world. All furnaces in this manual are Listed by the UL. They have passed all safety and efficiency requirements for both gas and oil in the U.S. The UL Listing label is also your assurance that UL employees inspect our furnaces during the manufacturing process. This can happen several times a year on an unannounced basis.

NFPA Codes, Standards, recommended practices, and guides referred to in this document are approved by the American National Standards Institute. State and local codes are adopted from these standards.



DANGERS-CAUTION-FIRE HAZARDS (Burn wood logs or coal only)



- ⚠ Do not install a power humidifier on the warm air plenum.
- ⚠ Do not load wood above secondary air tube. Doing so will cause over-fire and damage to combustion chamber could result.
- ⚠ Do not attempt to light a wood or coal fire when oil or gas vapors are present. An explosion or flashback could cause personal injury.
- ⚠ Do not install on combustible floor.
- ⚠ Load wood or coal carefully or damage may result to fire brick or refractory pot liner.
- ⚠ Fire the oil or gas burner at least once each week during the heating season. This will insure clean nozzles and electrodes.
- ⚠ Inspect air filter regularly. Clean or replace as necessary. Filter size is 20" x 25" x 1".
- ⚠ If an over-fire situation should occur, be sure ash door and fire door are closed. Turn thermostat down to close primary air damper.
- ⚠ In the event of an electrical power failure, remove air filter and be sure ash door and fire door remain closed.
- ⚠ In the event of a soot or creosote fire, call your fire department immediately. Turn thermostat down to close primary air damper and make sure ash door and fire door are closed.

Unpack and Check Your Cartons

INSPECT SHIPMENT

Your furnace is shipped complete in three cartons. Note any damage to the shipping cartons. Remove all items from your shipping cartons. Check all items against the packing list below. Note any items lost or damaged in shipment. Refer to the exploded view and parts list in the back of the manual for the part names and numbers of missing or damaged items. Keep the small parts in the parts bag until you are ready to install them.

PACKING LIST

1. Carton One: The basic furnace comes in the crate. Inside the filter door, below the flue outlet, is the pre-assembled, circulating fan, motor, belt, drives and drip shield. The air filter lies in a frame above the fan. Inside the furnace wood-firing door are:

- Three wood grates (installed)
- Secondary air shut-off assembly
- Smoke pipe draw collar (Polar Unit Only)
- Primary air draft tube
- Door handle weldment and handle assembly for both fire door and ash pan.

Remove these items and set aside for later installation.

2. Carton Two: This accessory package contains the following items:

- Secondary air intake cover
- Thermostats
- Barometric damper
- Fan and limit control
- Damper control unit
- Transformer
- Wiring harness
- Fume sensor (gas only)
- Owner's manual
- Warranty sheet

Remove these items and set aside for later installation.

3. Carton Three: The oil or gas burner is in this carton. It is pre-assembled and ready for installation.

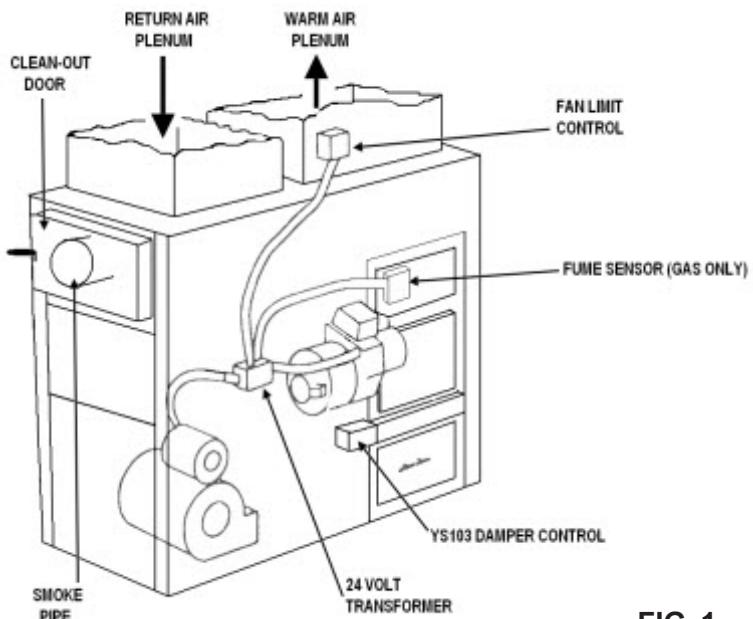


FIG. 1

Furnace Features - Eagle I - Husky

1 YUKONTROL SOLID-STATE FURNACE CONTROL

FURNACE CONTROL This is the solid-state control that coordinates the gas or oil burner function with the wood/coal damper so that your home is always comfortable using your choice of fuels.

2 MORE HEAT EXCHANGE SURFACE MEANS LESS HEAT UP THE CHIMNEY

The secondary heat exchanger is made up of type 304 Stainless Steel tubes, which the heat produced by the furnace, must pass through before entering the chimney. This feature increases the heating surface to 54 square feet. Standard gas or oil furnaces have only 25-30 square feet.

3 GAS BURNER OPTION FOR AUXILIARY FUEL

Our gas model comes with a Wayne P250 AF DIN hi-efficiency gas burner. This burner features a Honeywell electronic ignition and gas valve. It is certified by Underwriters Laboratories to provide up to 80.1% steady state efficiency. It can be switched from LP Gas to Natural Gas or visa-versa. This burner can be interchanged with our Wayne model MSR oil burner at your option.

4 THE OIL (OR GAS) BURNER FIRES INTO AN ENGINEERED PYROLITE HIGH TEMPERATURE CERAMIC CHAMBER WHICH ASSURES COMPLETE

COMBUSTION This flame is then directed horizontally into the wood/coal firebox to automatically ignite those fuels. This design assures the gas or oil burner to be free of any wood/coal smoke from the fire box.

5 THE EAGLE I INCORPORATES AN EASY ACCESS CLEAN-OUT DOOR TO MAINTAIN TOP HEATING EFFICIENCY

This is an openable door which connects the four secondary heat tubes to the flue pipe that leads to the chimney. Keeping the inside of your furnace clean insures high efficiency.

6 2-INCH THICK HI-TEMPERATURE FIREBRICK SURROUNDS THE WOOD/COAL FIRE

The EAGLE I furnace features 180 pounds of firebrick. It is 18 inches high on the side opposite the burner and the backside of the firebox. It is 9 inches high on the

burner side. This firebrick not only protects the steel from the extreme combustion temperatures in the firebox, but it also retains a substantial amount of heat after the wood/coal fire burns down.

7 AFTER-BURNER JET SYSTEM GIVES MAXIMUM SOLID FUEL BURNING EFFICIENCY

Twenty percent of the air required for proper coal/wood combustion is drawn in above the firebox, and then distributed around the top of the flame to create an afterburner effect. Forty percent of the energy in wood/coal leaves the initial flame in the form of an unburned gas (smoke). This patented system burns these gases, thereby substantially increasing the efficiency of the wood or coal.

8 2 DIFFERENT STYLES OF HEAVY CAST IRON GRATES

IRON GRATES It is imperative that 80 percent of the air for combustion enters the firebox from below a wood coal grate to insure an efficient and clean burning fire. Our standard heavy cast iron grate is adequate for a wood fire. A much heavier cast iron shaker grate is also available as an option for dense coal use.

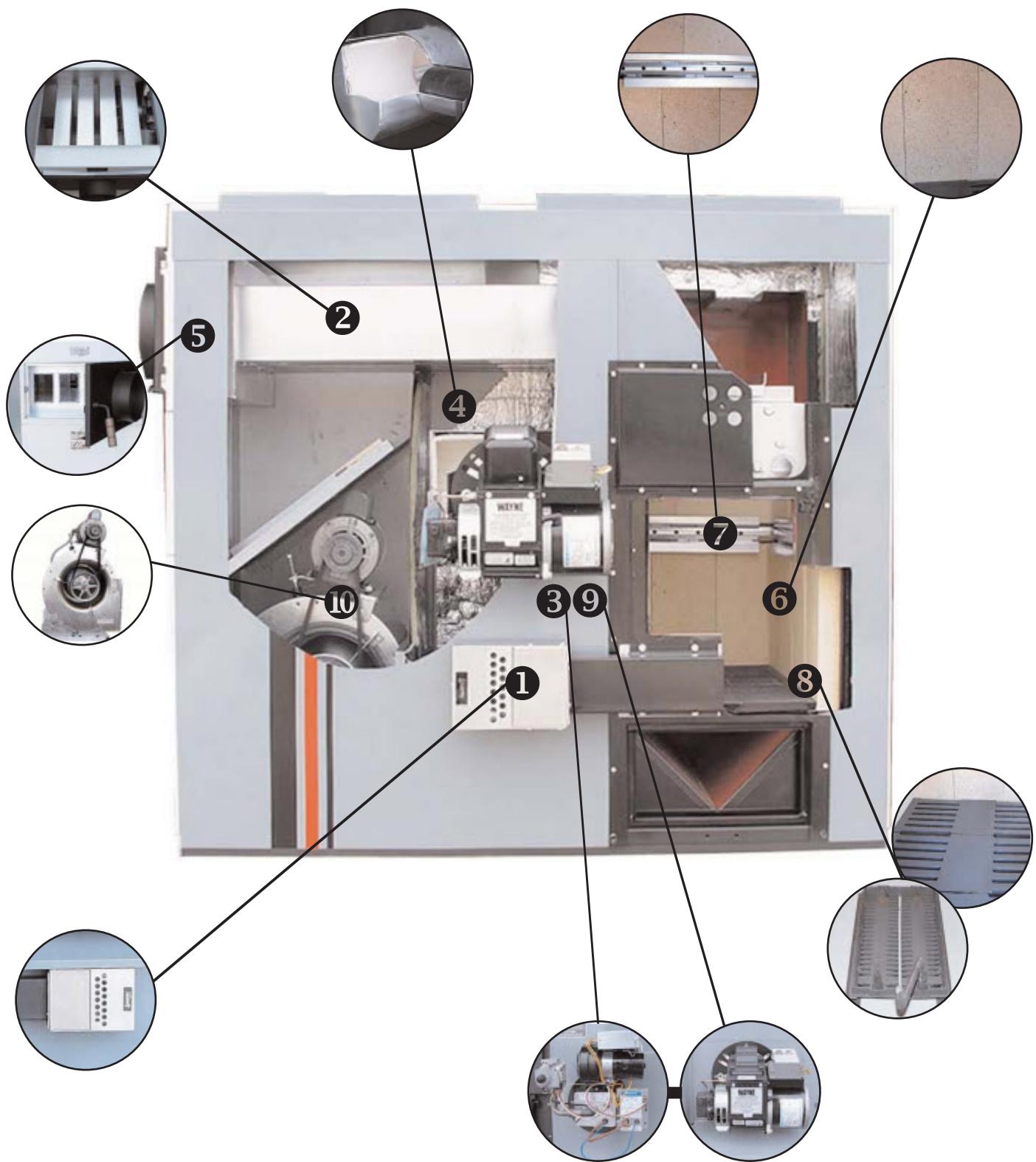
9 OIL BURNER OPTION FOR AUXILIARY FUEL

If oil is your preference for a back-up fuel, your burner will be a Wayne model MSR 321-009 hi-efficiency oil burner. Features are a Stainless Steel flame retention head and Honeywell Premium controls. It is certified by Underwriters Laboratories to provide up to 80.1 % steady state efficiency. If at some time in the future, you decide you would rather have LP or Natural Gas as your backup fuel, this burner can be interchanged with our Wayne P250 AF DIN gas burner. (A nice insurance policy.)

10 AIR CIRCULATING BLOWER AND MOTOR

The EAGLE I is designed with 10 inch wide, ten inch- diameter belt drive blower. This oversized blower turns slower than ordinary furnaces because of its large size. It is therefore quieter than most furnaces. Each EAGLE I is equipped with a premium Class A motor with Class B insulation, which means it will operate in a higher temperature atmosphere. This motor also features a 1.35 service factor, which means it has 35% more power than a standard motor of the same size. Up to four tons (48,000 BTU's) of air conditioning can be added to an EAGLE I.

Furnace Features - Eagle I - Husky



Furnace Features - Eagle II - Polar

1 YUKONTROL SOLID-STATE FURNACE CONTROL

FURNACE CONTROL This is the solid-state control that coordinates the gas or oil burner function with the wood/coal damper so that your home is always comfortable using your choice of fuels.

2 MORE HEAT EXCHANGE SURFACE MEANS LESS HEAT UP THE CHIMNEY

The 8-inch diameter type 304 Stainless Steel secondary heat exchanger recovers heat that would normally go out the chimney. This added surface plus the large firebox and massive primary heat exchanger provide a total of 82 square feet of heating surface compared to 30-35 square feet on a comparable size oil or gas furnace.

3 GAS BURNER OPTION FOR AUXILIARY FUEL

Our gas model comes with a Wayne Model P250 AF DIN hi-efficiency gas burner. This burner features a Honeywell electronic ignition and gas valve. It is certified by Underwriters Laboratories to provide up to 80.1% steady state efficiency. It can be switched from LP Gas to Natural Gas or visa-versa. This burner can be interchanged with our Wayne model MSR oil burner at your option.

4 2 DIFFERENT STYLES OF HEAVY CAST IRON GRATES

IRON GRATES It is imperative that 80 percent of the air for combustion enters the firebox from below a wood/coal grate to insure an efficient and clean burning fire. Our standard heavy cast iron grate is adequate for a wood fire. A much heavier cast iron shaker grate is also available as an option for dense coal use.

5 A SEPARATE OIL OR GAS FIRE CHAMBER ENGINEERED FOR THOSE FUELS

This is an important feature. The chamber is lined with PYROLITE™, an extremely high temperature resistant ceramic material. It assures efficient combustion of oil or gas, and directs those flames into the wood burning chamber for automatic ignition of the wood fire.

6 FIRE BRICK LINING EXTENDS FURNACE LIFE

FURNACE LIFE Every Eagle furnace features two inch thick fire brick, 18" high. Fire brick is used, not only because of its lasting quality, but because it

7 AFTER-BURNER™ JET SYSTEM GIVES MAXIMUM SOLID FUEL BURNING

EFFICIENCY It extracts maximum BTUs from the wood or coal. Superheated air is introduced above the fire to ignite and extract heat from the unburned combustible gases. Without this feature, up to 40% of the available solid-fuel energy would be wasted.

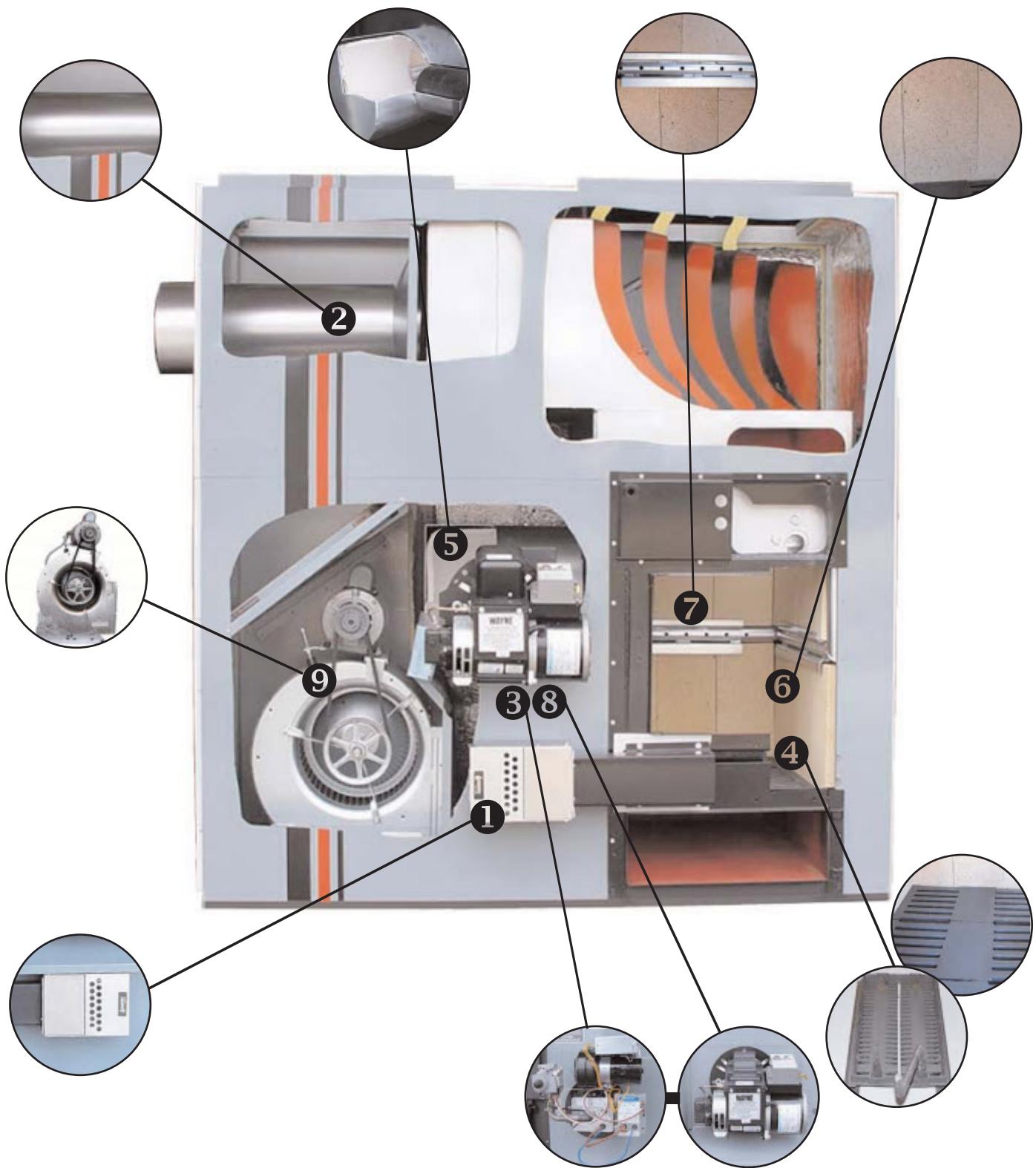
8 OIL BURNER OPTION FOR AUXILIARY FUEL

If oil is your preference for a back-up fuel, your burner will be a Wayne model MSR 321-009 hi-efficiency oil burner. Features are a Stainless Steel flame retention head and Honeywell Premium controls. It is certified by Underwriters Laboratories to provide up to 80.1 % steady state efficiency. If at some time in the future, you decide you would rather have LP or Natural Gas as your backup fuel, this burner can be interchanged with our Wayne P250 AF DIN gas burner. (A nice insurance policy.)

9 AIR CIRCULATING BLOWER AND MOTOR

The EAGLE II is designed with 10 inch wide, ten inch- diameter belt drive blower. This oversized blower turns slower than ordinary furnaces because of its large size. It is therefore quieter than most furnaces. Each EAGLE II is equipped with a premium Class A motor with Class B insulation, which means it will operate in a higher temperature atmosphere. This motor also features a 1.35 service factor, which means it has 35% more power than a standard motor of the same size. Up to 5 tons (60,000 BTU's) of air conditioning can be

Furnace Features - Eagle II - Polar



Specifications

MODEL LWO-112 (Oil)

Input rating	140,000 BTU/HR
Nozzle	1.0 G.P.H. - 80 H
Burner	Wayne Model - MSR

MODEL LWG-112 (Gas)

Input rating.....	140,000 BTU/HR
Output rating.....	112,000 BTU/HR
	NAT
Orifice	7/32" (.218 dia.)
Manifold Pressure	3.5 W.C.P
Burner	LP 9 (.136 dia.) 11.0 W.C.P. Wayne Model P250-AF-DI-Y

MODEL LWO-112 or LWG-112

Blower Size (Belt Drive)	10" x 10"
Blower C.F.M	800 - 1800
Motor Size	1/3 - 1/2 - 3/4 HP
Firebrick Lined.....	(7) 9" x 6" x 2" • (8) 12" x 6" x 2"
Cast Iron Grates - Standard	(3) 16" x 8"
Wood Fire Door	11" x 10"
Air Filter.....	20" x 25" x 1"
Wood Combustion Chamber Size	24" x 16"

MODEL LWO-168 (Oil)

Input rating.....	189,000 BTU/HR
Output rating.....	151,000 BTU/HR
Nozzle	1.35 G.P.H - 80 H
Burner	Wayne Model - MSR

MODEL LWO-168 (Gas)

Input rating.....	189,000 BTU/HR
Output rating.....	151,000 BTU/HR
	NAT
Orifice	"F" (.257 dia.)
Manifold Pressure	3.5 W.C.P
Burner.....	LP "23" (.154 dia.) 11.0 W.C.P. Wayne Model P250-AF-DI-Y

MODELS LWO-168, or LWG-168

Blower Size (Belt Drive).....	11" x 10"
Blower C.F.M	1200 - 2000
Motor Size	1/3 - 1/2 - 3/4 HP
Firebrick	(10) 9" x 6" x 2" • (7) 12" x 6" x 2" • (1) 9" x 4-1/2" x 2"
Cast Iron Grates - Standard	(3) 18" x 8"
Wood Fire Door.....	13-1/4" x 13-1/4"
Air Filter.....	20" x 25" x 1"
Wood Combustion Chamber Size	24" x 18"

NOTE: It is recommended that a 2", non combustible, raised pad be used for the furnace. This will prevent moisture from getting under the furnace and causing corrosion.

Plan Your Installation

PLAN YOUR INSTALLATION

It is recommended to read through the entire manual before beginning your installation. Follow all steps exactly. Reading this manual will also help you get all the benefits from your furnace.



CAUTION: Read these rules and the instructions carefully. Failure to follow these rules and instructions could cause a malfunction of the furnace. This could result in death, serious bodily injury and/or property damage.

IMPORTANT!

CHECKING THE FURNACE INSTALLATION AND MAKING ADJUSTMENTS

It is imperative that a heating professional, before startup and at the beginning of each heating season, inspects the entire installation and make any necessary adjustments.

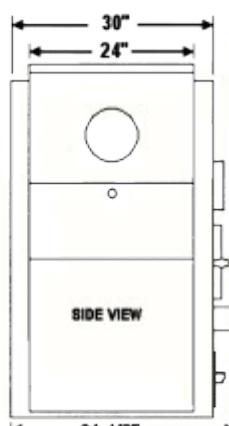
RULES FOR SAFE INSTALLATION AND OPERATION

1. Check your local codes. The installation must comply with them.
2. Use only the type of fuel approved for this furnace. Over firing will result in failure of heat exchanger and cause dangerous operation.
3. Oil storage tanks, piping and valves should be installed and tested in accordance with NFPA 31.
4. You must have a sufficient supply of combustion air to the area in which the furnace is located. (See page 28).
5. **Factory Built Chimneys:** Connect this furnace to a chimney that complies with NFPA 211 3-1.2. Factory built chimneys for use with wood-burning appliances shall comply with the HT requirements of UL 103 or CAN/ULC-S629-M87. This means you must install what is referred to as type HT all fuel chimney.

Masonry Chimneys: Connect this furnace to a chimney that complies with NFPA 211 3-1.2. A field constructed chimney of solid masonry units, bricks, stones, listed masonry chimney units, or reinforced Portland cement concrete that is lined with suitable chimney flue liners and built in accordance with the provisions of Chapter 4 of this standard.

6. Follow a regular service and maintenance schedule for efficient and safe operation.
7. Before servicing, allow furnace to cool. Always shut off electricity and fuel to furnace when working on it. This will prevent electrical shocks or burns.

LWO-112 & LWG-112



Unit Dimensions

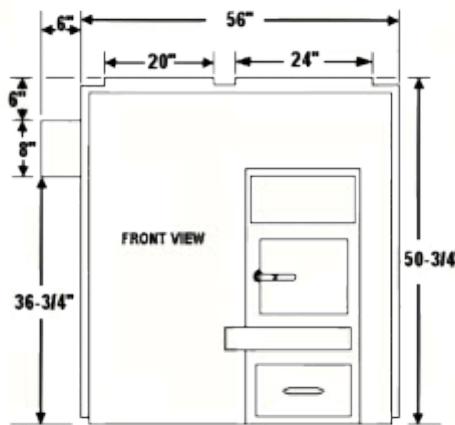


FIG. 2

LWO-168 & LWG-168

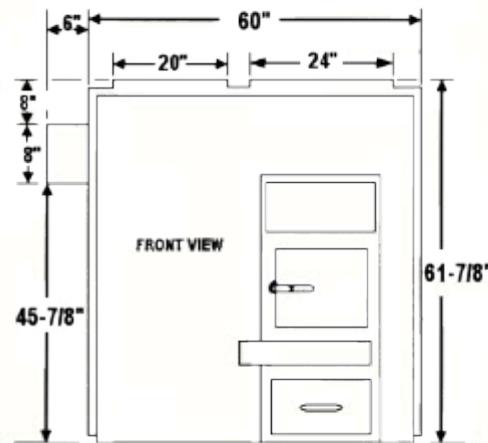
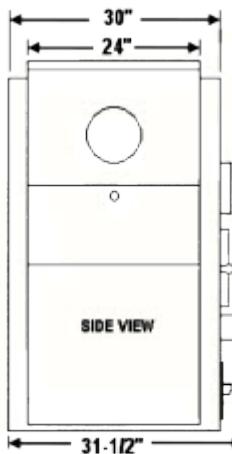


FIG. 3

LOCATING THE FURNACE

The furnace should be located no more than 10 feet away from chimney. You will need 1" rise per linear foot of pipe as a minimum.

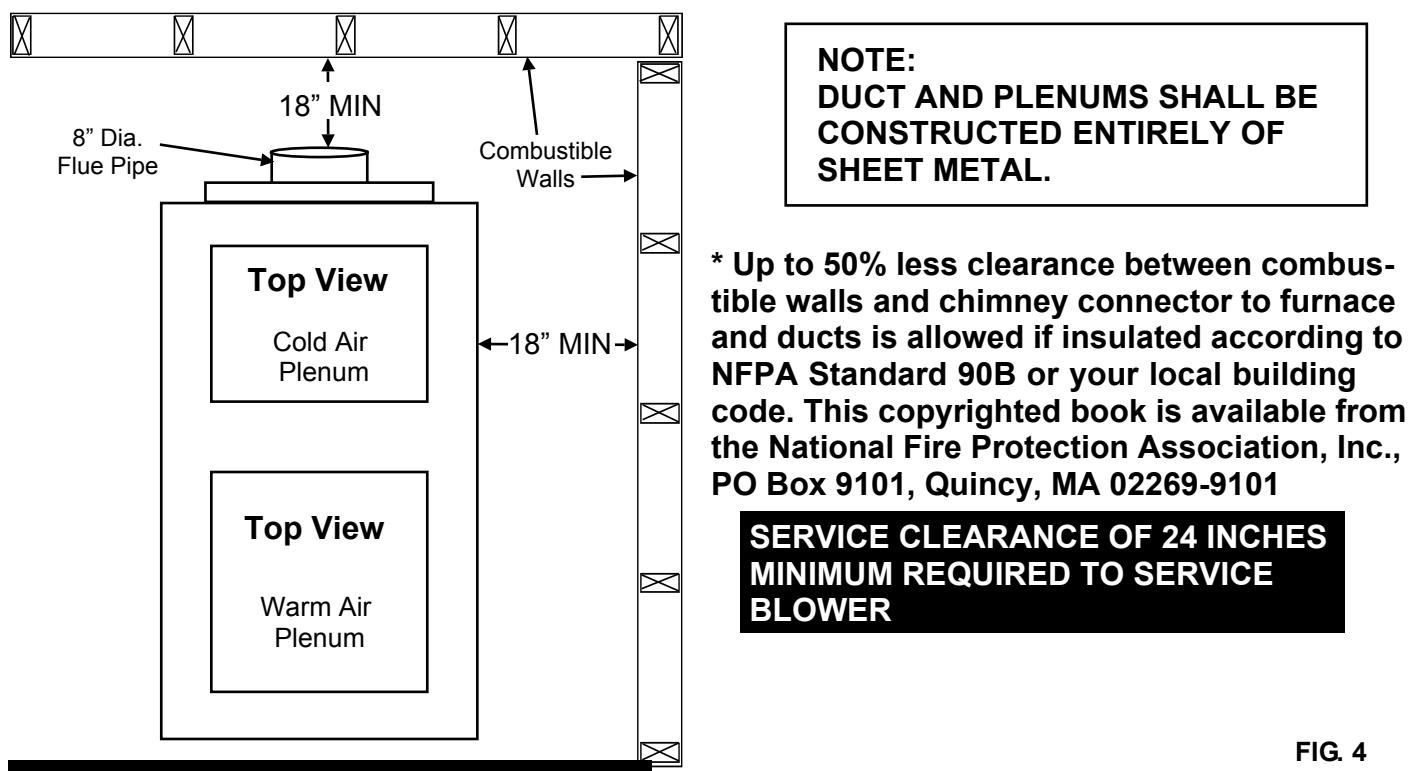
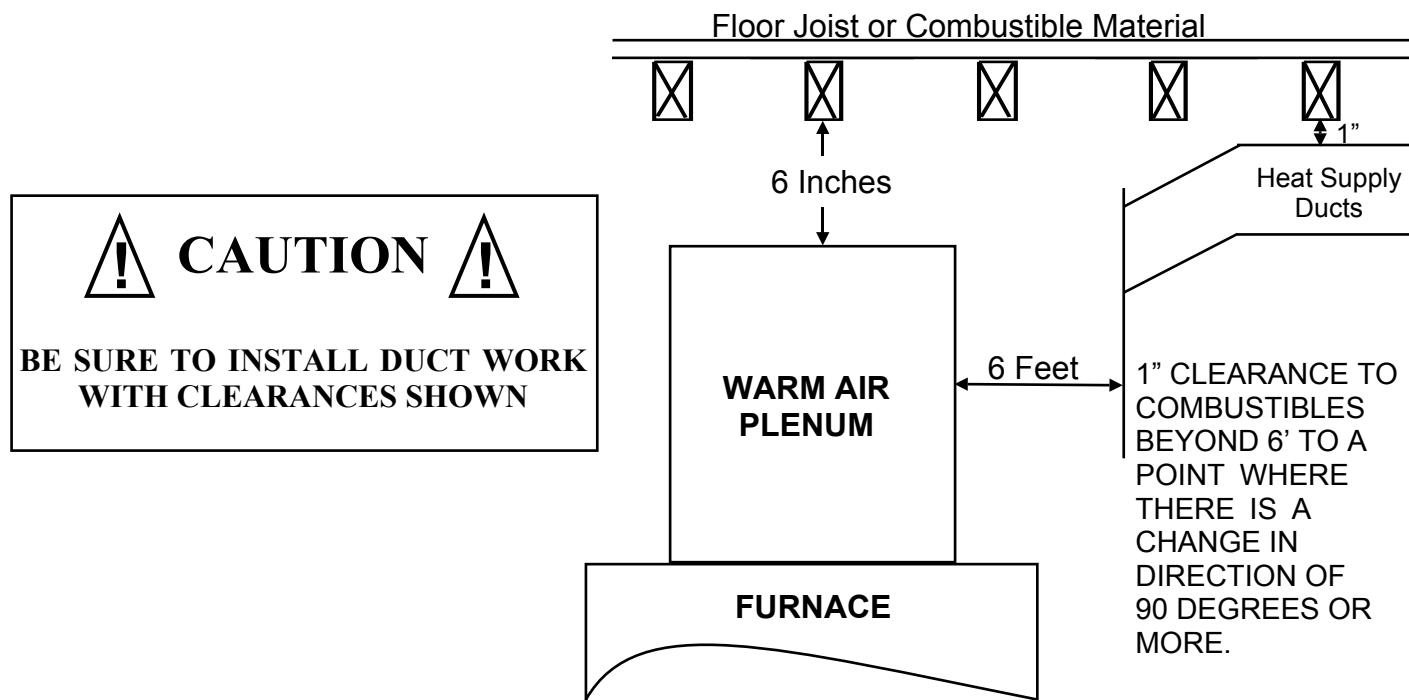
The furnace should be located with respect to building construction and the placement of other equipment. Consideration should be given to sufficient clearance. Sufficient clearance provides adequate access for the cleaning of surfaces; the replacement of air filters, blowers, motors, controls and the chimney connector; and for the lubrication and servicing of moving parts. See Fig. 4-5.

UL Listed installation clearances from combustible surfaces are 48" in the front of this furnace. 18" from the sides, rear and smoke pipe. See Fig. 5.

Plan Your Installation

CLEARANCES TO COMBUSTIBLES

ABOVE TOP OF WARM AIR PLENUM	FROM THE FRONT	FROM SIDES AND BACK	FROM CHIMNEY CONNECTOR	6 FT OF PLENUM	6 FT OF PLENUM
6"	48"	18" *	18"	6"	1"



Plan Your Installation

TYPICAL INSTALLATION

DUCTS AND PLENUMS SHALL BE CONSTRUCTED ENTIRELY OF SHEET METAL.

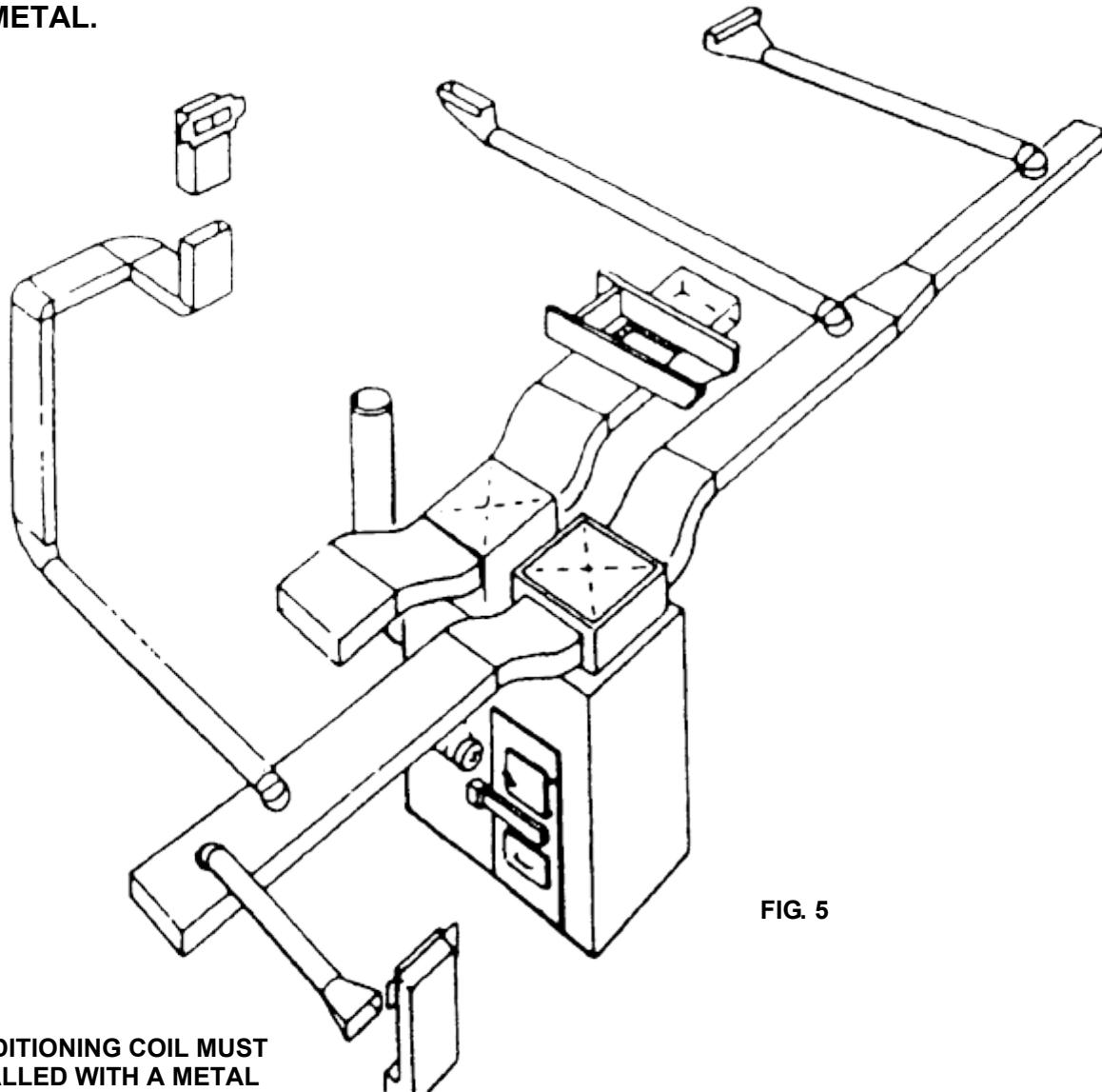


FIG. 5

AIR CONDITIONING COIL MUST BE INSTALLED WITH A METAL CONDENSATE PAN.

DO NOT USE PLASTIC PAN

DUCTS SHOULD BE LARGE ENOUGH TO HANDLE GRAVITY AIR FLOW IN THE EVENT OF ELECTRIC POWER OR FURNACE FAN FAILURE.

Installation

PLACE FURNACE

Review all instructions in the Planning Your Installation section. Place the furnace in the pre-selected location. Refer to Figs. 4 & 5 (on page 12) in the Planning Your Installation section. Make sure the furnace is level.

SECONDARY AIR INTAKE COVER

1. Remove secondary air intake cover from accessory package and align over mounting holes located above fire door assembly on face of furnace. See Fig. 7.
2. Insert 12 ea. # 10 x 3/4 hex HD drill screws (furnished with cover) through mounting holes and tighten.

SECONDARY AIR SHUT OFF MODELS LWO-112 & LWG-112 ONLY

1. Remove round secondary air shut off disc from plastic bag.

2. Screw disc to the intake cover just installed.

Opening the disc when burning wood provides room air to the round perforated tubes between the top and bottom row of firebrick, thereby causing secondary combustion of the unburned wood gases as they leave the initial flame. This patented feature increases wood burning efficiency up to 40% while reducing smoke and creosote. When burning gas or oil for extended periods of time, this disc should be closed.

It is not necessary to provide this disc on models LWG- 168 and LWO-168. Maximum efficiency is achieved without this disc.

DRAFT TUBE INSTALLATION

Remove the 8 bolts already screwed in where draft tube gasket is in place. Mount tube over gasket. Make sure the gasket aligns with the long slotted hole. Bolt tube to the furnace below the fire door. See Fig. 7 & 8.

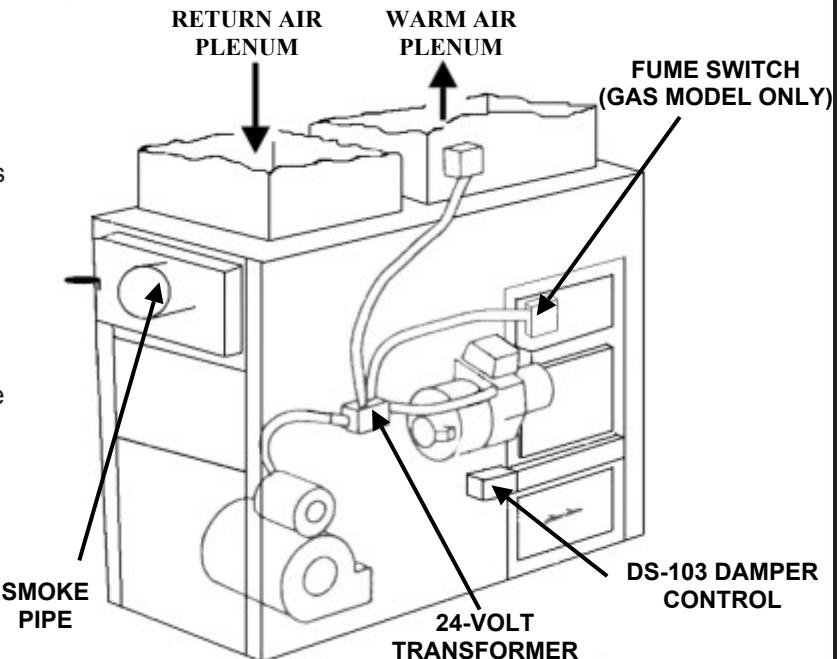


FIG. 6

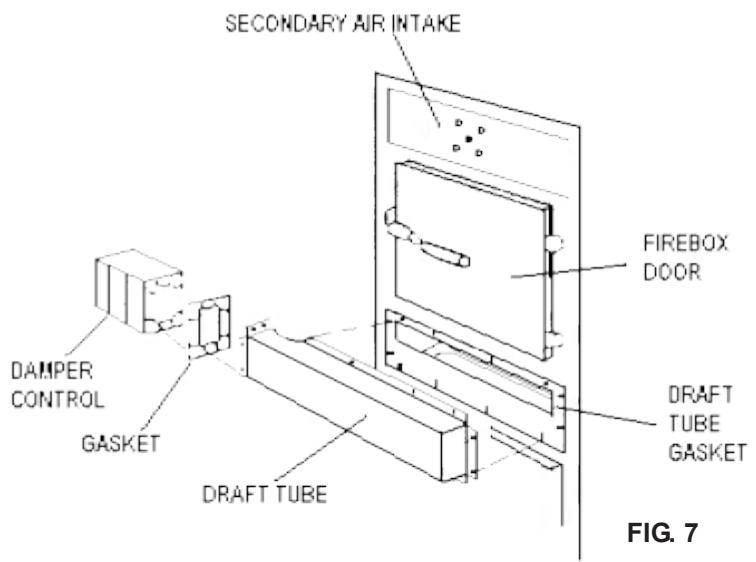


FIG. 7

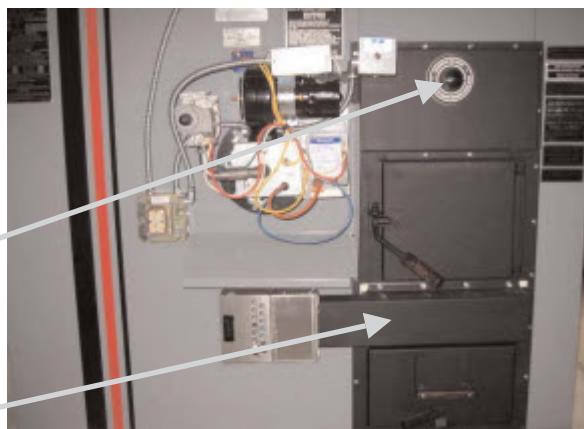


FIG. 8

Installation

OIL BURNER INSTALLATION

- **Model LWO-112 burner** has a (140,000 BTU input) 1.00 G.P.H. 80 degree H nozzle installed at the factory.
- **Model LWO-168 burner** has a (189,000 BTU input) 1.35 G.P.H. 80 degree H nozzle installed at the factory.

Install burner as follows:

1. Make sure hole in side of pyrolite chamber lines up with hole in the end of the blast tube. (See Fig. 9)
2. Install drip shield (shipped in blower compartment) over studs. Place gasket (packed in burner box) over drip shield. (Fig. 10)
3. Remove nuts from burner mounting studs on face of furnace.
4. Place gasket (packed on burner box) over studs and install drip-shield. (Shipped in blower compartment.)
5. Insert burner tube into furnace. The burner mounting flange should be tight against the drip-shield and furnace front.
6. Install mounting nuts and tighten.

GAS BURNER INSTALLATION

- **Model LWG-112** A 7/32" dia. orifice has been installed at the factory. (140,000 BTU input - nat. gas). To convert to LP gas, see manufacturers instructions packed with the burner.
- **Model LWG-168** A "F" (.257 dia.) orifice has been installed at the factory (189,000 BTU input - nat. gas). To convert to LP gas, see manufacturers instructions packed with burner.

Install burner as follows:

1. Make sure hole in side of pyrolite chamber lines up with hole in the end of the blast tube. (See Fig. 9)
2. Remove nuts from burner mounting studs on face of the furnace.
3. Install drip shield (shipped in blower compartment) over studs. Place gasket (packed in burner box) over drip shield. (Fig. 10)
4. Assemble mounting flange over burner blast tube (flat surface away from burner housing). Do not tighten clamping screws.
5. Insert burner tube into furnace. Align holes in mounting flange over studs on furnace. Replace nuts removed in step 2 above and tighten.
6. Insert burner so that burner housing is tight against mounting flange (end of blast tube should be flush with inside of pyrolite chamber). Level burner and tighten clamping screws.

CUT AWAY VIEW BURNER COMBUSTION CHAMBER

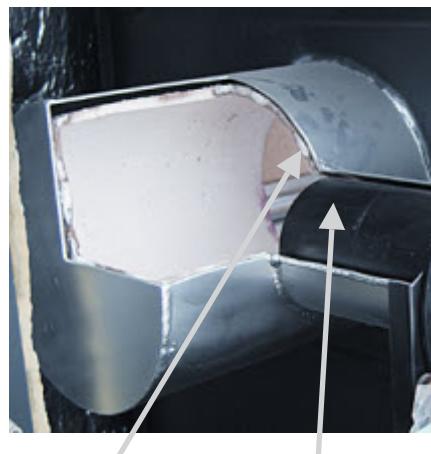


FIG. 9

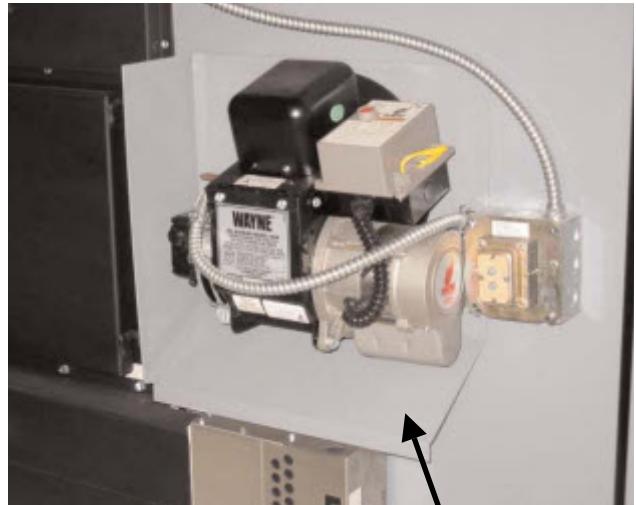


FIG. 10

Installation

DRAW COLLAR (Models LWO-168 & LWG-168 ONLY)

Firmly attach the draw collar around the stainless steel smoke pipe. Keep the field installed smoke pipe at least 2 " away from draw collar. This will insure that smoke leaving the furnace will not be drawn into the circulating air stream. See Fig. 11.

NOTE: Only Models LWO-168 and LWG-168 are equipped with a draw collar.

NOTE: If barometric damper control is installed horizontally as illustrated, it must be at least 8 inches from furnace smoke outlet.

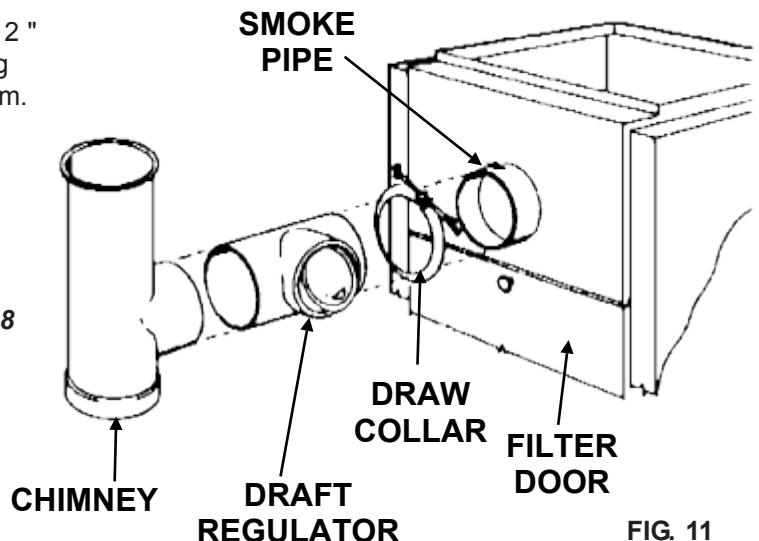


FIG. 11

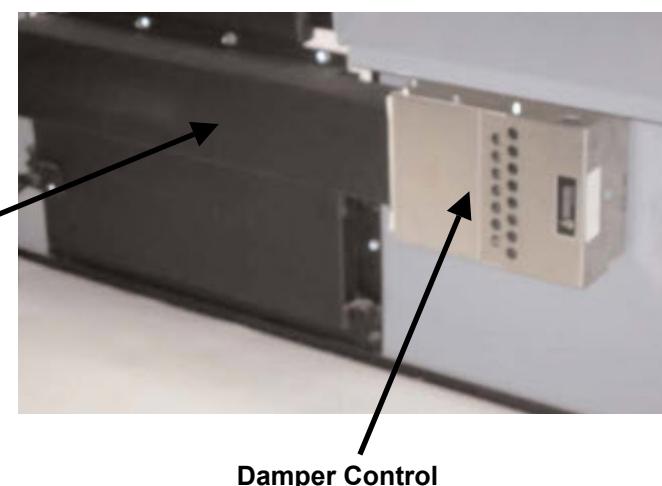
DAMPER CONTROL

NOTE: Refer to the wiring diagrams in the back of manual in "Exploded Views and Parts List."

Remove control from accessory box and install as follows:

1. Remove the four screws that hold the gasket to the DS-103 panel.
2. Mount the DS-103 to the draft tube using screws removed above. Make sure gasket stays in place. See Fig. 12
3. Loosen the two screws located at slotted end of draft tube, and remove remaining 10 screws. Make sure gasket stays in place.
4. Mount DS-103 control and draft tube assembly to furnace as shown. See Fig. 12
5. The electrical connections will be completed later in the Installation Instructions.

FIG. 12



Questions? Visit www.yukon-eagle.com or call 1-800-358-0060

Installation

SMOKE BAFFLES

The smoke baffles are factory installed. They must be checked to see that they have not become dislodged during shipping. See Fig. 14-A. Complete the following steps to check the baffles:

1. Hold the baffle in proper position. Tilt the rear up to clear baffle mounting brackets.
2. Push baffle up to top of combustion chamber above all three brackets, level off, slide left and lower onto mounting brackets.
3. Check to see that all three brackets are engaged.
4. Repeat with second baffle, making sure baffles interlock as shown. See Fig 14-B. When properly installed, baffles will not move more than 1/4" in any direction.

NOTE: Failure to have baffles properly installed will severely reduce combustion efficiency.

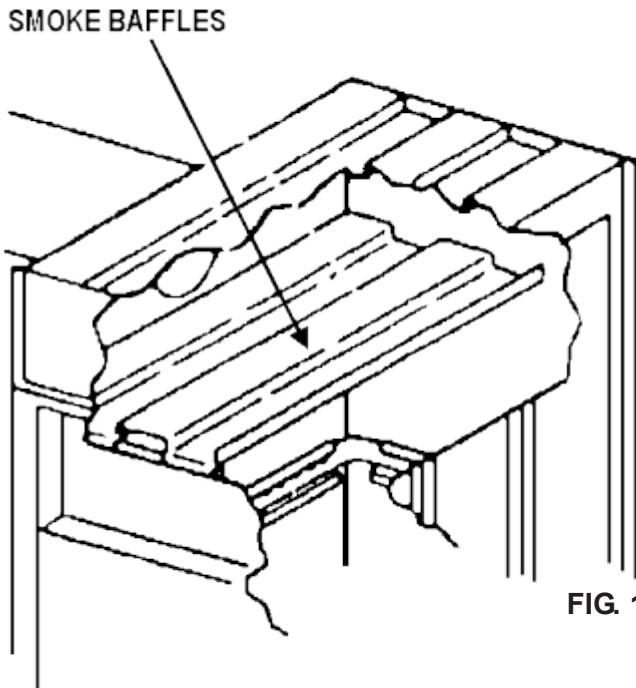
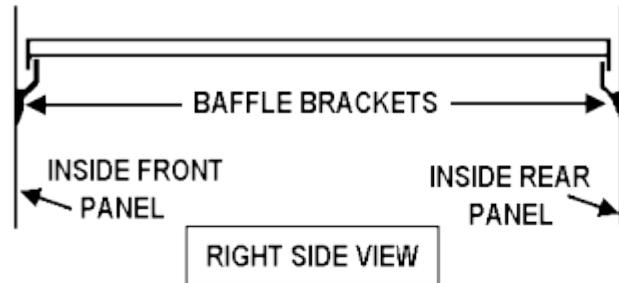


FIG. 14-A



RIGHT SIDE VIEW

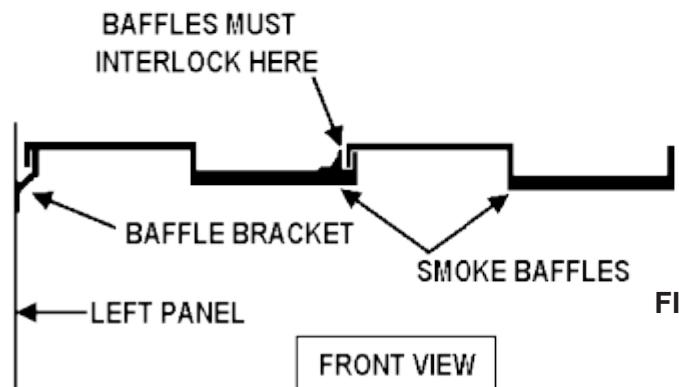


FIG. 14-B

Installation

INSTALLING THE HONEYWELL FAN/LIMIT CONTROL

Included in the accessory carton is a white sheet metal bracket that is 8-1/4 inches high and 3-1/4 inches wide. It has a 7/8" hole in it 6 inches from the bottom. Right below the 7/8" hole are 2 screw holes. This bracket also has 2 screw mounting holes on the bottom 1-1/4 inch flange. (Shown in Fig. 15)

1. Place the sheet metal plenum on top of the 24" X 24" warm air duct opening.
2. Attach the fan/limit control mounting bracket to the top of the furnace using sheet metal screws to attach the bracket into the screw holes (pre drilled) that are on the furnace.
3. With the fan/limit control bracket up against the sheet metal plenum, either drill a 7/8" hole and two 1/8" holes through the holes into the sheet metal plenum or use the bracket as a template.
4. Screw the mounting bracket onto the bracket with the 2 screws that are furnished.
5. Install the fan/limit control through the mounting bracket and into the plenum.
6. Tighten the mounting bracket set screw into the fan/limit control.

NOTE:

If you intend to install air conditioning, the air conditioning coil should be mounted above fan limit control. Use metal water drain pan only. Do not use a plastic pan as high temperatures resulting from electric power failure or furnace fan failure could result in fire.

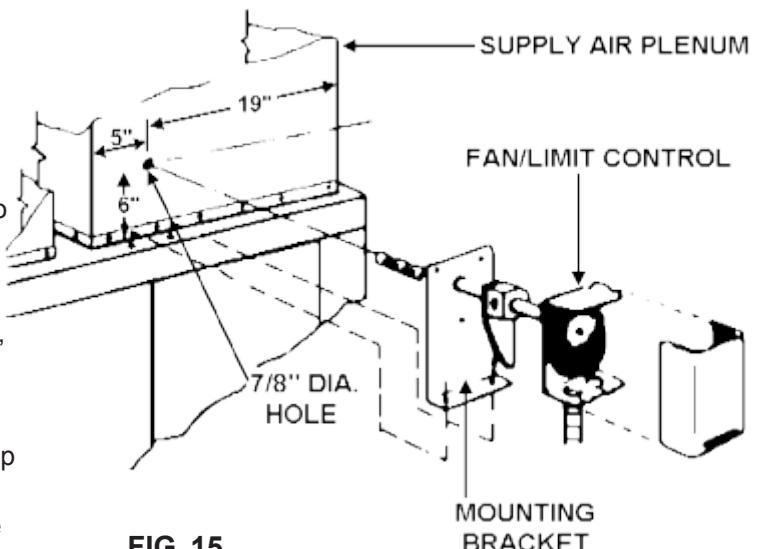


FIG. 15

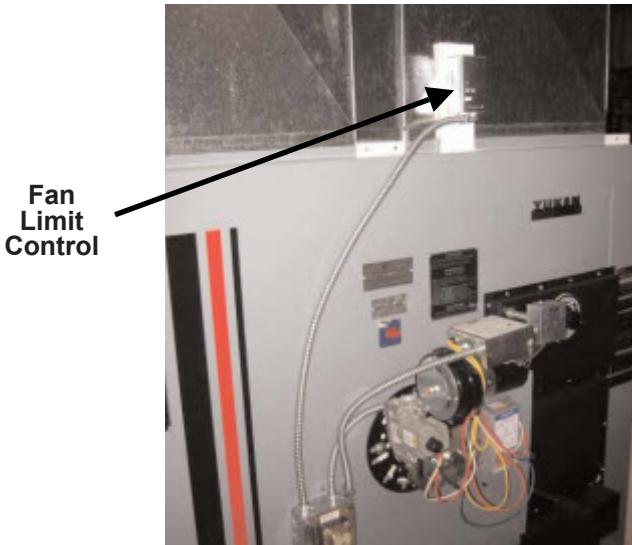


FIG. 16

Installation

MOUNTING THE THERMOSTATS

The thermostats must be mounted on an interior centrally located wall. Place them away from direct sunlight, drafts, and approximately 5 feet above the floor. It is not required that they be level. Place them right next to each other. See Fig. 17.

Two Honeywell digital thermostats are furnished with all multi-fuel furnaces. The larger thermostat controls your gas, oil or electric, whichever back-up fuel you have. It offers one temperature setting for when you want the burner to start. This is in the event your wood supply is inadequate in keeping your home at its temperature setting. It also has a night setback feature that allows you to keep lower temperatures at desired times. This thermostat also controls the air conditioning, if applicable.

The smaller thermostat controls the wood/coal room temperature. It does not have a night setback feature.

If you have no plans for air conditioning you will need a 3-wire thermostat cable from your furnace to your thermostat. If you intend to install air conditioning a 5-wire thermostat cable is required.

TYPICAL THERMOSTAT SETTINGS

Place 3 or 4 8" diameter logs into wood chamber. Set wood thermostat 5 degrees above room temperature. Set oil/gas thermostat 10 degrees above room temperature. Burner will then ignite and start the wood burning. When wood is adequately burning, reset gas/oil thermostat to 5 degrees below desired room temperature. Set wood thermostat to desired wood temperature. With the proper amount of wood in the firebox, the wood thermostat will keep the room temperature at the wood thermostat setting. When the wood is no longer able to keep up with the heating demands of your home and the temperature falls to the oil/gas thermostat setting, the burner will come on until that thermostat is satisfied.

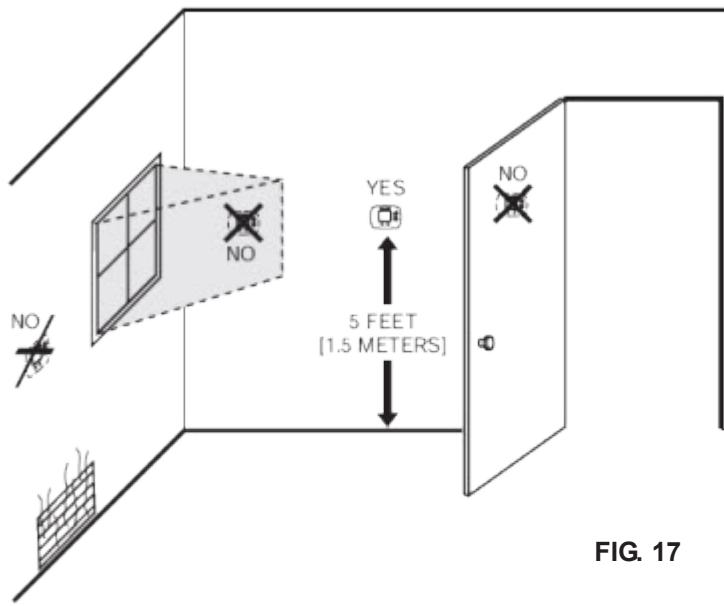


FIG. 17



**Honeywell
Programmable
Thermostat**

**Honeywell
Digital
Thermostat**

Installation

FUEL TANKS AND FUEL LINES

Fuel tanks and fuel lines must be installed in accordance with requirements of NFPA 31.

If fuel lines are under 30 feet in length, it is satisfactory to use 3/8" O.D. copper tube. Never use tube smaller than 3/8" O.D. If the lines are over 30 feet in length, we recommend 1/2" O.D. tube. Use good flare connections on the fuel lines and, whenever possible, avoid splicing the tube. Never make a splice or joint underground. Whenever possible, avoid overhead lines; avoid kinks and traps in the lines. Do not fasten fuel lines directly to floor joists, sills, or girders. Whenever possible, support fuel lines with sound-absorbing devices.

SINGLE LINE SYSTEM

When fuel does not have to be lifted from tank to burner use a single line hookup. A single line system can be used when outlet on fuel tank is higher than inlet on burner.

TWO LINE SYSTEM

To lift fuel from tank to burner use a two-line system. On outside buried tanks, install a supply line from tank to burner and return line from burner back to tank. The supply line is called the suction line. The suction line should extend down within a few inches of the bottom of fuel tank.

OIL FILTER

A fuel filter should be used with either an outside or inside fuel tank. In all cases install the filter in accordance with local codes. The filter should always be installed inside, near the furnace. An inside tank and any internal or external fire or flame appliance being served by the tank must be at least 5 feet away from the furnace. New oil replacement cartridges should be installed annually or as required. Always use the new gasket that is supplied with the replacement cartridge. Tighten the top of the filter carefully and check the gasket for proper fit.

FILL AND VENT PIPES

Fuel tanks must be equipped with a fill pipe and a vent pipe. Fill pipes should be terminated in a convenient place for filling. They should be equipped with a watertight cap. It is recommended that 1-1/4" pipe be used for the vent. The vent should extend outdoors served by the tank and

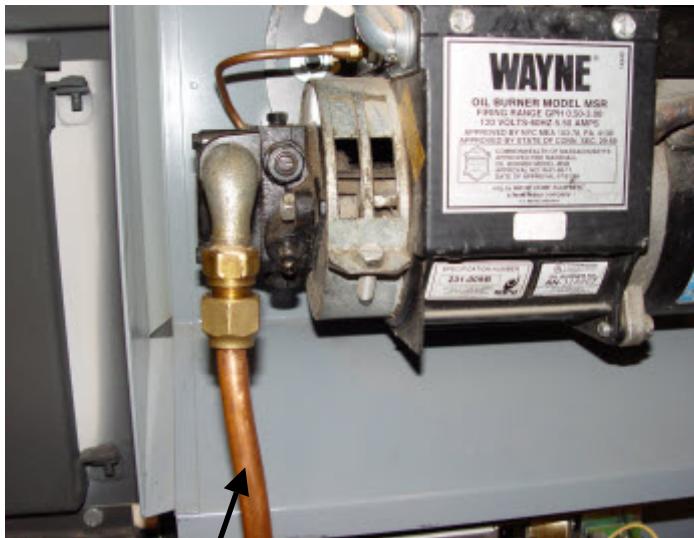


FIG. 18

FUEL LINE

Installation

GAS PIPE SIZING

Check with your local gas supplier to determine total gas load for all your gas appliances. Size pipe accordingly.

GAS PIPING

All piping must comply with local codes. In the absence of local codes, follow the national fuel gas code ANSIZ-233.1. A sediment trap or drip leg must be installed in the supply line to burner. (See Fig. 19)

A union must be installed in the gas line. It should be adjacent to and upstream from the control manifold. It should be downstream from the manual main shut-off valve.

A manual shut-off valve must be installed in the gas supply line. It must have a 1/8" N.P.T. plugged tapping for test gauge connection.

The building structure should not be weakened by the installation of the gas piping. The piping should not be supported by other piping. It should be firmly supported with pipe hooks, straps, bands or hangers. Butt or lap welding pipe should not be bent.

The gas piping should be installed so as to prevent an accumulation of condensation. It must be protected against freezing. A horizontal pipe should pitch so it grades toward the meter and is free from sags. The pipe should not be run through or in an air duct or clothes chute.

After the piping and meter connections have been checked for leaks, purge system of air. Be sure to relight all pilots on other appliances.

The gas line should be a separate supply direct from the meter to burner. A new pipe should be used. Locate it so a minimum amount of work will be required in future servicing. The piping should be installed so it is durable, substantial and gas tight. It should be clear and free from cutting burrs and defects in structure or threading. Cast iron fittings or aluminum tubing should not be used for the main gas circuit. Joint compounds (pipe dope) should be used sparingly on male threads only. The joint compounds should be approved for all gases.

Method of Installing a Tee Fitting Sediment Trap

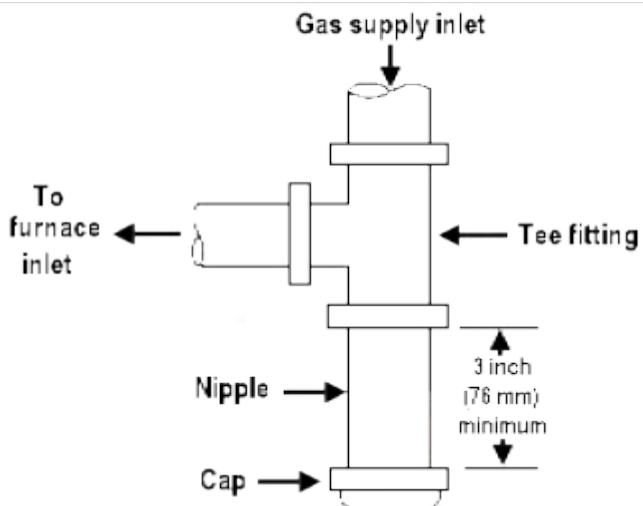


FIG. 19

Installation

FUME SENSOR (GAS MODELS ONLY)

The FUME SENSOR is a manual reset heat/pressure sensor. It will shut down the gas burner. This occurs when there is a chimney down draft, plugged chimney, plugged smoke pipe, or a plugged secondary heat exchanger. If the gas burner shuts down because of any of the above conditions, before the burner can restart, you must press the red button down to manually reset it.

Wire per schematic shown in Exploded View section in back of manual.

Complete the following steps to install the Fume Sensor onto the furnace:

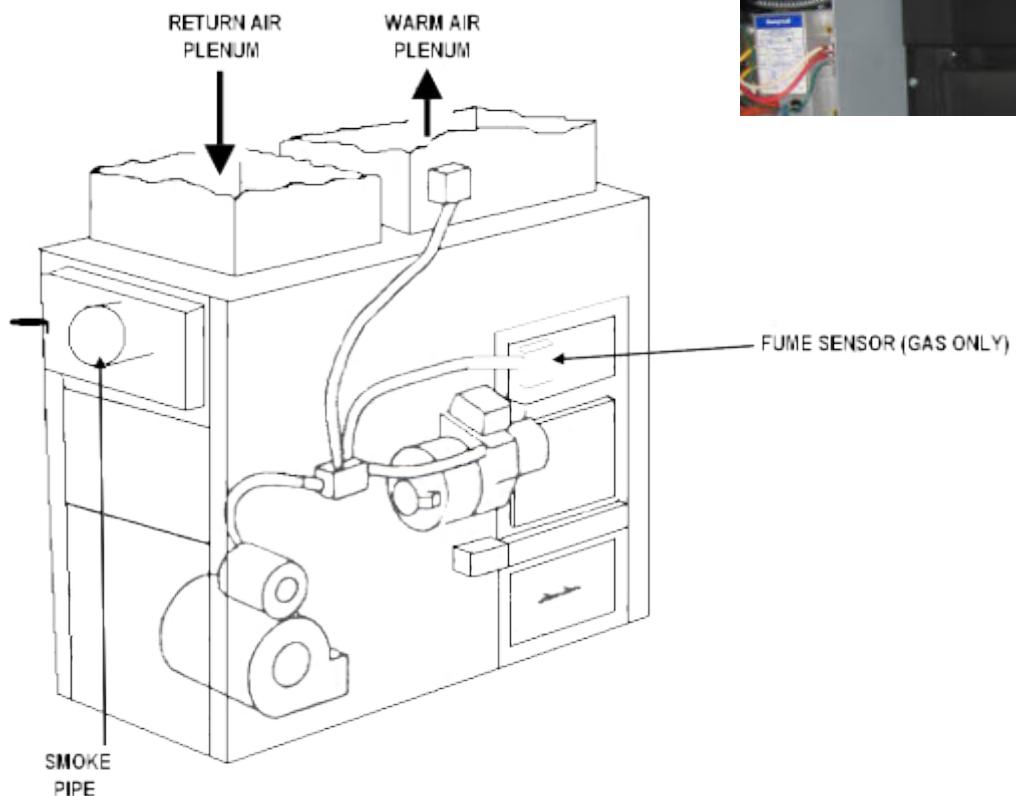
1. Screw fume sensor into threaded hole located in secondary air intake cover. See Fig. 20.
2. Align sensor so the air slot on back of sensor cover is in the vertical position. Then tighten clamping nut.



**Field Controls® Model
WMO-1 Safety Switch**



FIG. 20



Installation

ELECTRIC WIRING

All electrical wiring must be done in accordance with the National Electrical Code. The code needs to be legally authorized in the area where the installation is being made. The circuit protector device must be located in a convenient place near the furnace. No lighter than 14 AWG wire should be used in the furnace power supply circuit. All furnaces covered by this manual and installed in the United States of America operate on 115 Volts, 60 Cycle, 1-Phase Alternating Current with a 20 amp circuit protector device.



WARNING: Turn off electric power at circuit protector device before making any line voltage connections.

WIRING THE FURNACE

The furnace wiring is provided in harness form. Mount the 4 x 4 junction box on 7/8" diameter opening on front of blower compartment. Secure with conduit connector and locknut. For the blower motor, secure with lead conduit and at least one screw. Connect components as shown in wiring diagrams. See Fig 22-23.



CAUTION: This furnace is not approved for use with aluminum wire.

NOTE: 24 volt wires from the transformer to DS-103 control, from burner to DS-103, and from thermostat to DS-103 need not be enclosed in conduit unless required by local codes. See Fig. 22-23.

DS-103 DAMPER CONTROL

The T&T terminals are connected to the T&T terminals on the gas or oil burner. The R terminal is not used. The C terminal is connected to the C terminal on the 24-volt transformer. Terminal 1 is connected to the wood thermostat (smaller stat). Terminal 2 is connected to the burner thermostat (larger stat). When Terminal 1 is energized by the wood thermostat, a relay on the circuit board energizes a solenoid that opens a damper that supplies air to the wood fire. When terminal 2 is energized, it closes this damper and energizes the T&T terminals, which in turn energizes the burner.

NOTE: Refer to the electrical drawings in the Exploded View/Parts List Section for details.



FIG. 22

24 volt Transformer

Electrical Junction Box

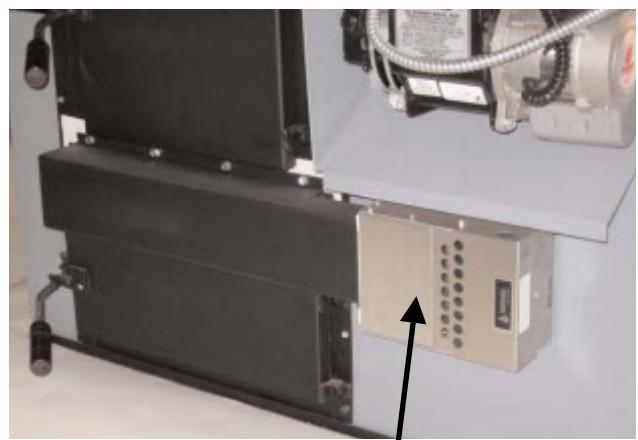
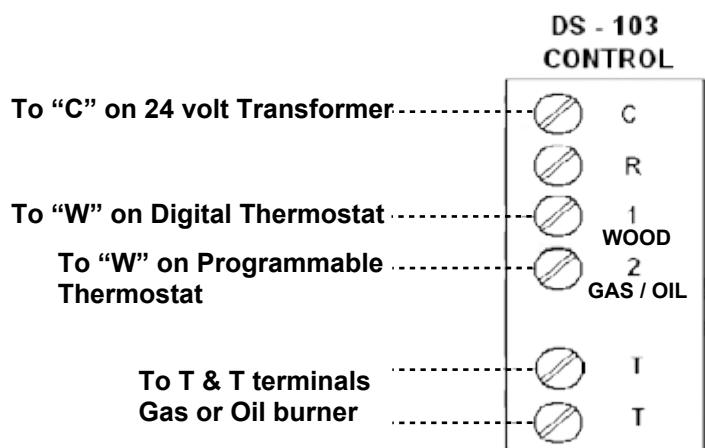


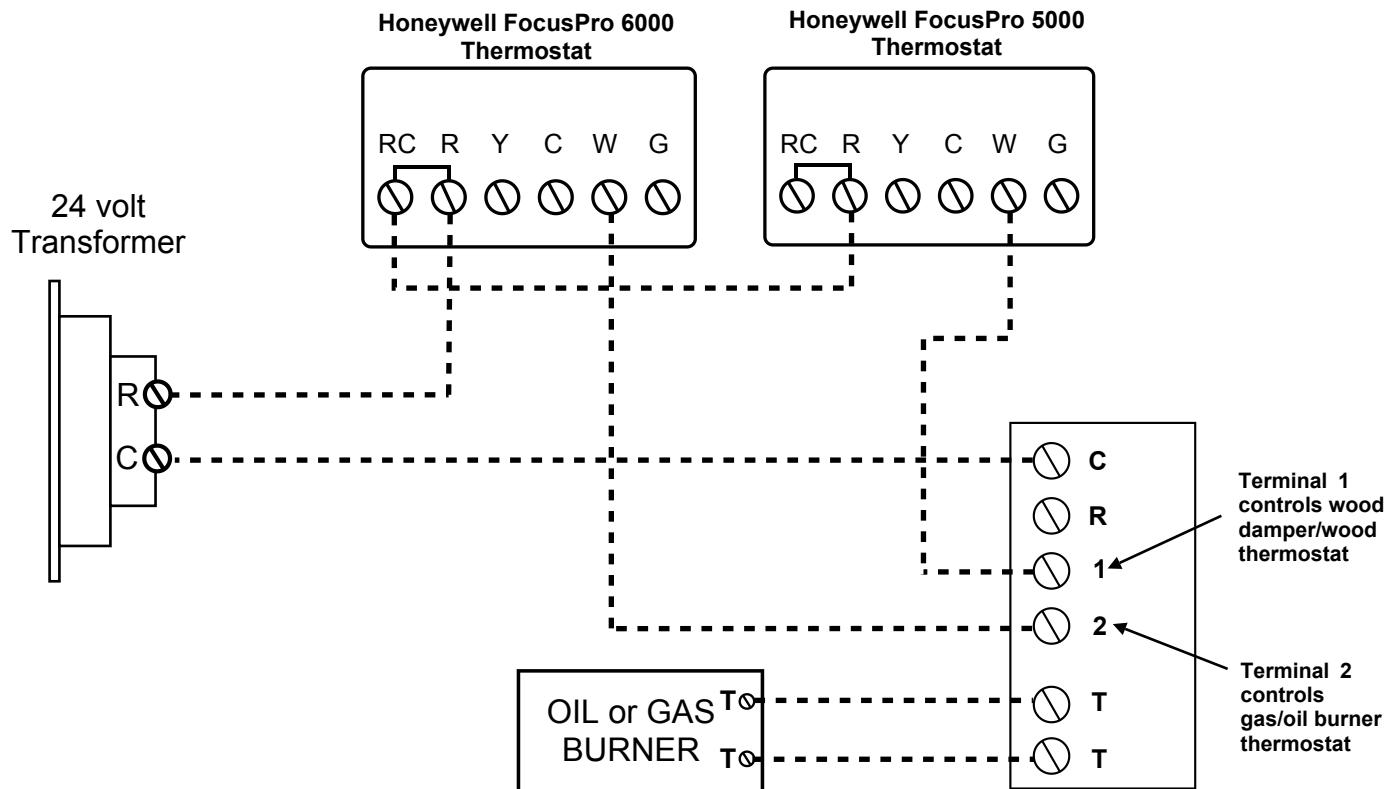
FIG. 23

DS-103 Damper Control

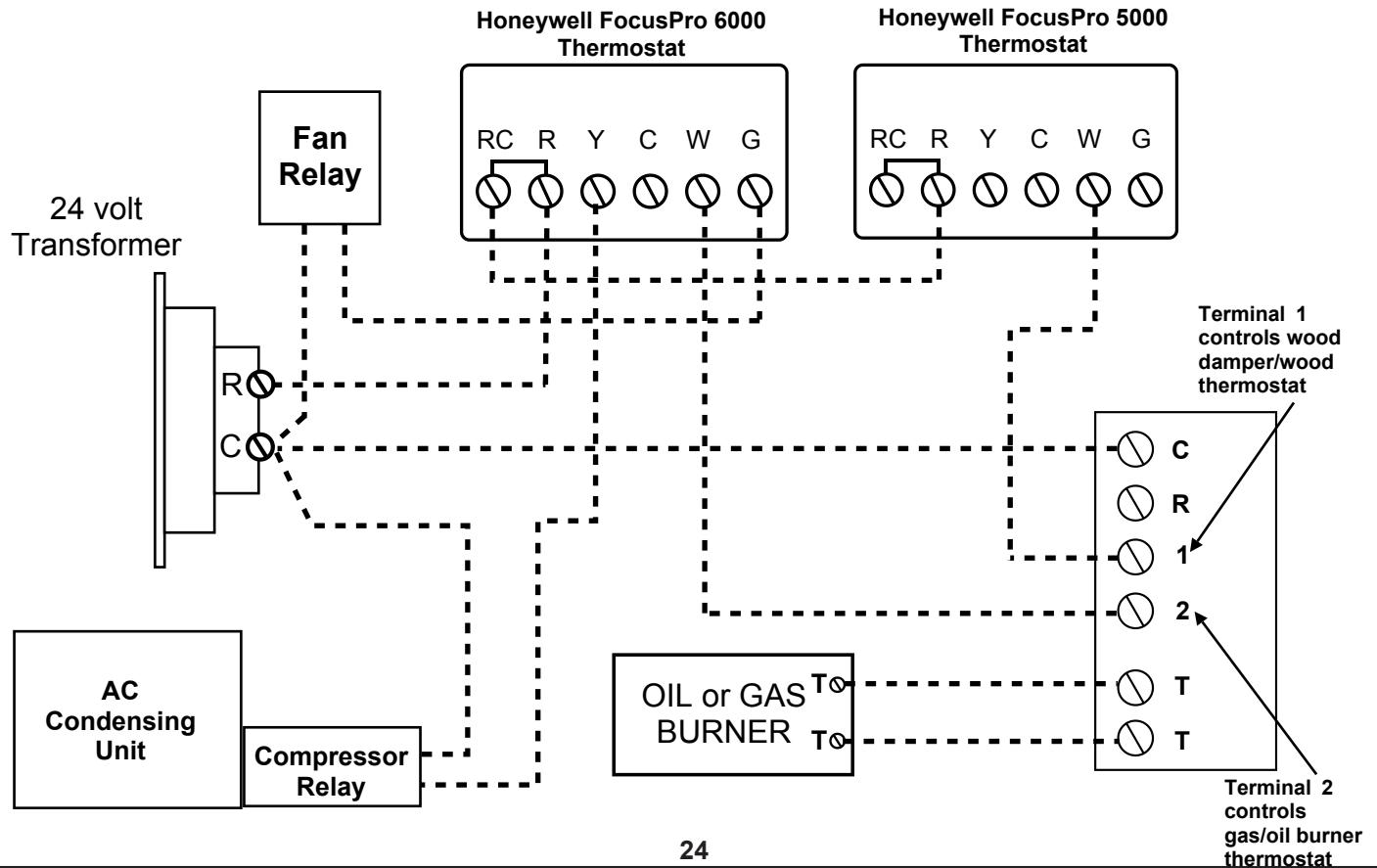


24 Volt Field Wiring

OIL OR GAS AND WOOD HEATING ONLY



OIL OR GAS AND WOOD HEATING WITH AIR CONDITIONING



Installation



CAUTION: Do not use any smoke pipes less than 24 gauge between furnace and chimney.

CONNECTING SMOKE PIPE

Set the smoke pipe end of the furnace as close to the chimney as possible. The rise of the smoke pipe toward the chimney must be at least one inch per linear foot of pipe. Do not exceed 10 feet in length. A clean out tee should be installed for removal of soot and fly ash.

Do not install smoke pipe longer than necessary to reach chimney. This is for purposes of trapping heat. The smoke outlet temperature is designed to carry by-products of combustion out through chimney. The smoke pipe must not pass through any combustible material.

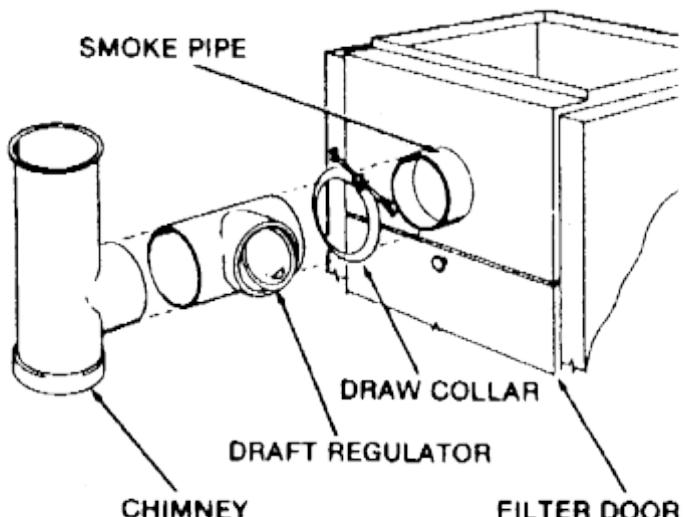


FIG. 24



WARNING: No damper, heat saver, or automatic vent damper device should be installed in or on smoke pipe. Except the barometric draft regulator.

The smoke pipe entrance into a masonry chimney should be at least 2 feet above the clean out. The smoke pipe must not extend into the chimney beyond the inner face of the chimney liner.

LESSER CLEARANCES TO COMBUSTIBLE MATERIALS ALLOWED

This furnace is UL Listed, requiring 18 inches from smoke pipe to a combustible surface. A reduction of 9 inches from a combustible ceiling and 12 inches from a combustible wall is allowed if the space is insulated according to NFPA 90B, table 6-5.1.2.



WARNING: DO NOT CONNECT THIS FURNACE TO A CHIMNEY SERVING ANOTHER APPLIANCE



WARNING: CHECK YOUR CHIMNEY.
The chimney should be no less than 8 inches inside diameter or equal. The chimney is a very important part of your heating system. It must be the right size, properly constructed and in good condition. No furnace can function properly with a bad chimney. The chimney must supply a draft of at least .03 Water Column. If possible, use a 15 foot or higher chimney. Add an additional foot to chimney for each 1000 feet of elevation above sea level.

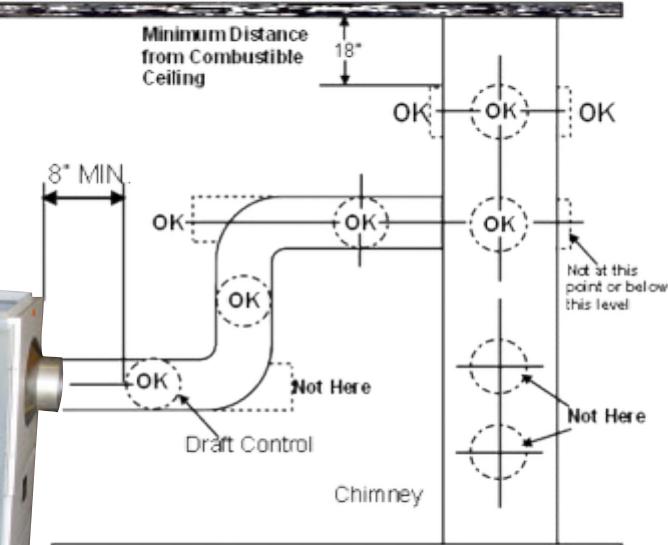
Installation

DO NOT ATTACH DRAFT CONTROL TO TOP OR BOTTOM OF FLUE PIPE, NOR IN ROOM SEPARATED FROM APPLIANCE. BEST LOCATION IS AS CLOSE TO APPLIANCE AS POSSIBLE.



FIELD R-C BAROMETRIC DRAFT CONTROLS

CHOOSING THE LOCATION



IMPORTANT
A MANOMETER MUST BE USED TO ACCURATELY ADJUST FLUE DRAFT

IMPORTANT:
MAKE THESE ADJUSTMENTS WHEN INSTALLING.

VERTICAL FLUE:

Adjustment weight must be in RIGHT HAND SLOT (Marked "V") in bracket on gate.

The arrow on flap at bottom of gate must line up with letter "V" on lower right part of gate. If it does not, remove flap, turn over and snap on to gate again.

Flap can be removed by inserting small screw driver at the back side of the gate between the gate and the flap, then pulling downward on flap.

HORIZONTAL FLUE:

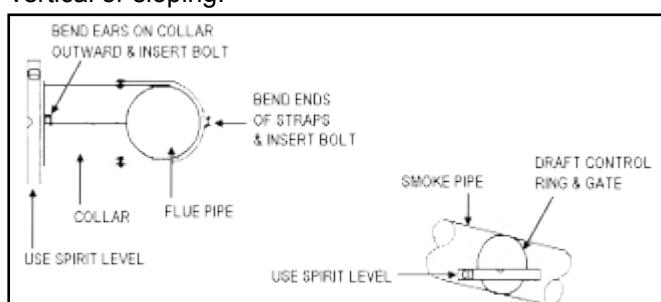
Adjustment weight must be in LEFT HAND SLOT (Marked "H") in bracket on gate.

The arrow on flap at bottom of gate must line up with letter "H" on lower left part of gate. If it does not, remove flap, turn over and snap on to gate again.

INSTALLATION

Install barometric draft control using a 24 or 26 gauge 8" X 8" X 8" galvanized or black sheet metal Tee.

Use Spirit Level to make sure that the control does not lean forward or backward but instead is plumb in both directions, regardless of whether the flue is horizontal, vertical or sloping.



INITIAL SETTING OF BAROMETRIC CONTROL

Set the control at a maximum of .03 or as low a draft as will give good combustion and meet the requirements for heat. Turn adjustment weight counter-clockwise to loosen, then slide in slot to proper position and tight. Bracket is marked 2, 4, 6, and 8, which indicates draft setting of .02, .04, etc. (These are drafts in flue adjacent to control, not over-fire drafts).

Questions? Visit www.yukon-eagle.com or call 1-800-358-0060

Installation

PROPER CHIMNEYS

The National Fire Protection Association (NFPA) requires that all factory built chimneys be Listed and installed in accordance with conditions of the Listing in the manufacturers instructions. NFPA also requires that your chimney extend at least three (3) feet above the highest point when it passes through the roof and at least two (2) feet higher than any portion of the building within ten (10) feet of the chimney.

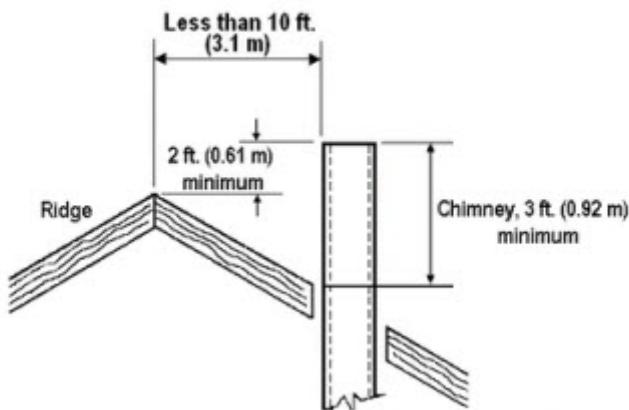
Factory built chimneys must be what NFPA refers to in NFPA 211 1-5.217.4 as Type HT. HT is an abbreviation meaning high temperature.

Masonry Chimneys as referred to in NFPA 211 1-5.2.17.6, a field constructed chimney of solid masonry units, bricks, stones, listed masonry chimney units, or reinforced concrete that is lined with suitable chimney flue liners and built with the provisions of Chapter 4 of this standard.

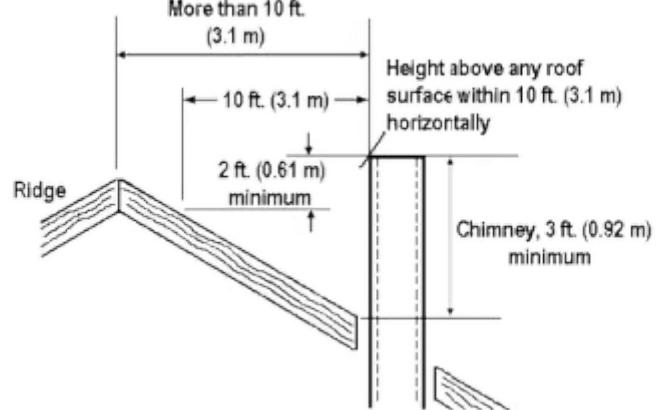
As described in NFPA 54 (National Fuel Gas Code) section 7.5.5 (c) A Listed combination gas and solid fuel appliance equipped with a manual reset device to shut off gas to the main burner in the event of flue gas spillage shall be permitted to be connected to a single chimney flue. The chimney flue shall be sized to properly vent the appliance.

All gas-solid fuel and oil-solid fuel combination furnaces in this manual are Underwriters Laboratories Listed for one flue.

CHIMNEY TERMINATION (LESS THAN 10 FEET)



CHIMNEY TERMINATION (MORE THAN 10 FEET)



CHOOSING A CHIMNEY

BEST CHOICE

Type HT Stainless Steel Class A

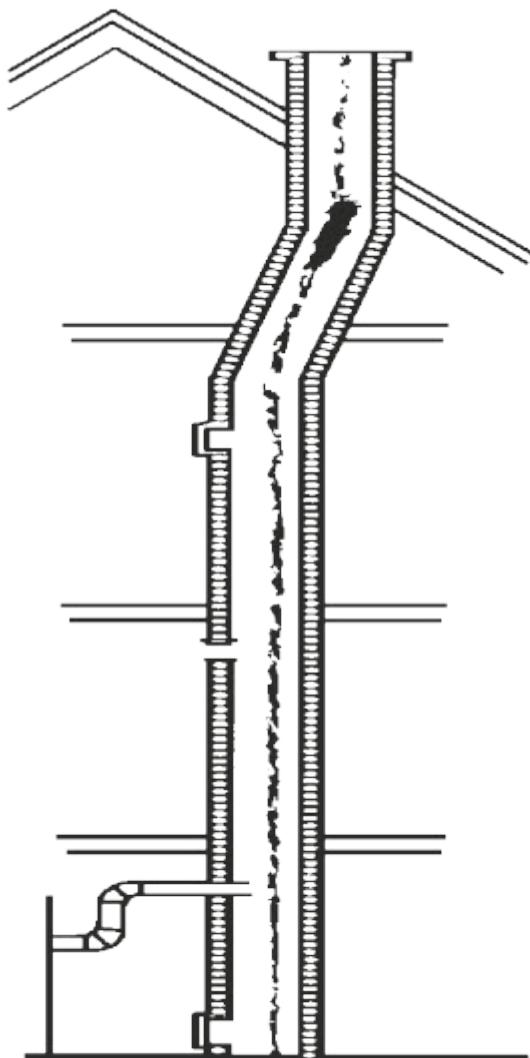
SECOND CHOICE

Indoor heated area - Masonry - 8" inside diameter

LAST CHOICE

Large outdoor brick or masonry - not insulated

Installation



TO MAKE A SMOKE TEST, USE A SPECIAL SMOKE BOMB AND WITH TOP OF CHIMNEY CLOSED, LOOK FOR LEAKS.

TOP OF CHIMNEY LOWER THAN SURROUNDING OBJECTS
REMEDY: EXTEND CHIMNEY ABOVE ALL OBJECTS WITHIN 30 FEET

CHIMNEY CAP PUSHED OVER FLUE OR
FLUE OBSTRUCTED BY A VENTILATOR
REMEDY: REMOVE OBSTRUCTION

ACCUMULATION OF SOOT OR DEBRIS
IN OFFSET
REMEDY: REMOVE

AIR LEAKS THROUGH CRACKS IN
FLUE AND CHIMNEY DISCLOSED BY
SMOKE TEST
REMEDY: CLOSE LEAKS WITH CEMENT

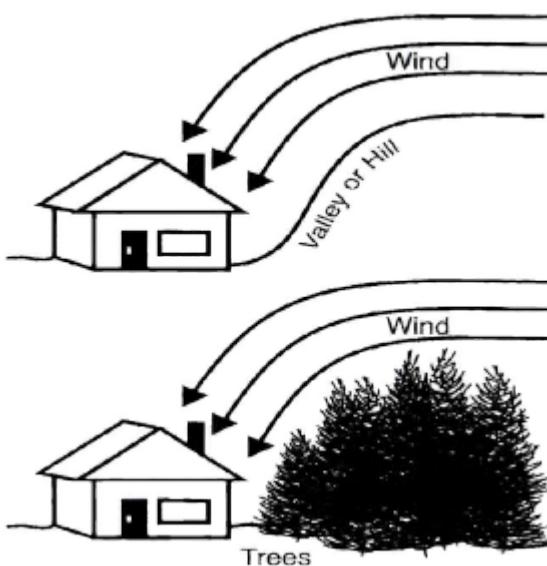
FLUE CAP RUSTY AND LEAKY
REMEDY: CLOSE LEAKS

VENT PIPE PUSHED INTO FLUE
REMEDY: MAKE END FLUSH WITH
INSIDE OF FLUE

LOOSELY FITTED VENT PIPE
DISCLOSED BY SMOKE TEST
REMEDY: CLOSE WITH CEMENT

LOOSELY FITTED CLEAN OUT DOOR
DISCLOSED BY SMOKE TEST
REMEDY: CLOSE LEAKS WITH CEMENT

OPENING BETWEEN FLUES DISCLOSED
BY SMOKE TEST
REMEDY: CLOSE OPENINGS



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Installation

COMBUSTION AIR

Make-up outside air must be provided to furnace for proper fuel combustion. This is provided by openings to outside of building. These openings shall have unobstructed areas not less than the areas of the flue pipe. See Figs. 25, 26, 27

IMPORTANT:

Outside air is needed to replace air used by the burner and wood combustion process. Outside air is required to replace air used for taking the by-products of combustion out the chimney. Outside air is needed to replace air expelled by kitchen or bathroom fans. It is also needed to replace air expelled by water heater chimneys or fans.

See Figs. 25, 26, 27

Failure to provide outside air to the furnace area will result in negative pressure, or vacuum, in the home. Smoke from the wood fire may not be drawn up the chimney. This causes creosote buildup and sometimes causes smoke to enter furnace room.

See Figs. 25, 26, 27



WARNING: You must provide for enough fresh air to assure proper combustion. The fire in the furnace uses oxygen and must have a continuous supply. The air in a house contains only enough oxygen to supply the furnace for a short time. Outside air must enter the house to replace that used by the furnace.

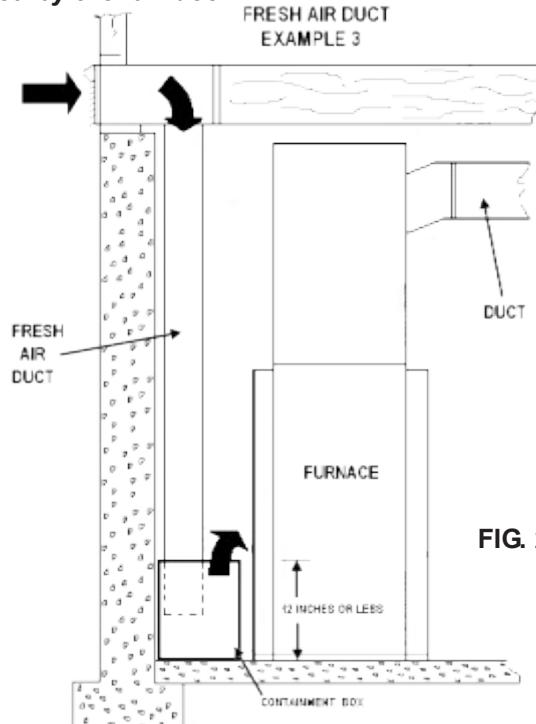


FIG. 26

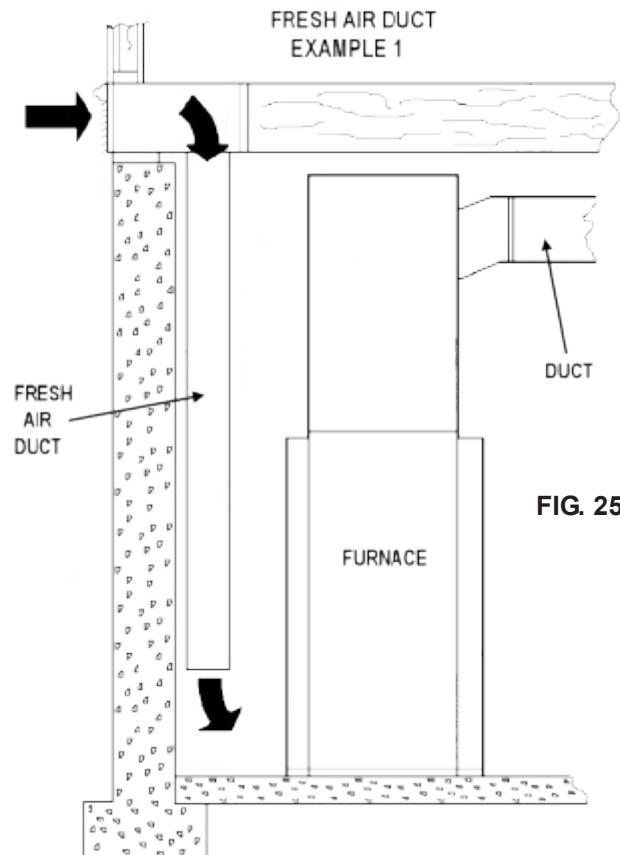


FIG. 25

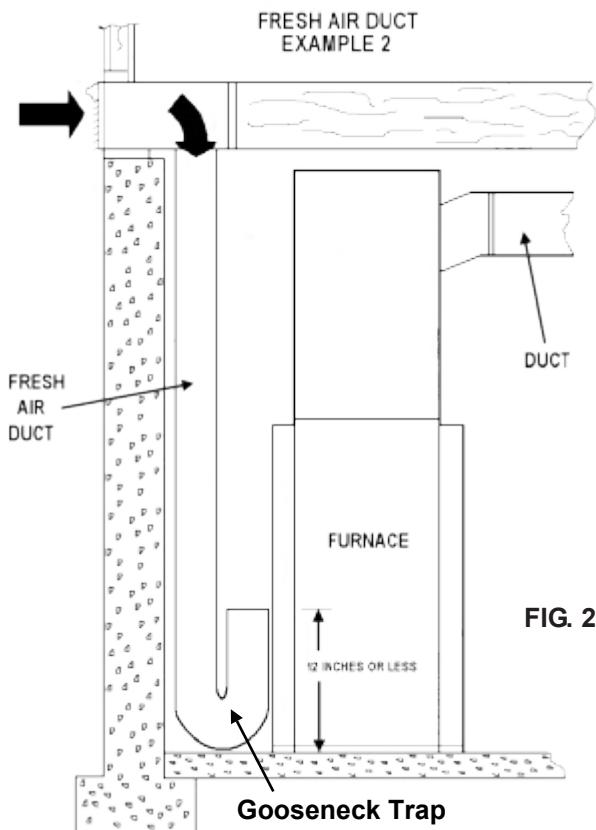


FIG. 27

Installation

FURNACE LOCATED IN CONFINED SPACE

When the furnace is in utility room, install two open grilles. (See Fig. 28.) Place them in a wall or door opening to the rest of the house. One grille will supply combustion air. Locate it near the floor. The other grille is for ventilation. Locate it close to the ceiling. Each grille must have a free area. It should be not less than one square inch for each 1000 BTU/hr. of the total input rating of appliances in confined space.

FOR EXAMPLE: Your furnace is rated at 150,000 BTU per hour. The water heater is rated 30,000 BTU per hour. The total is 180,000 BTU per hour. You need two grilles, each with 180 square inches of free opening. Metal grilles have about 60% free (open) area. Therefore, you need two metal grilles with 300 square inches each of louvered area. The height should be about half the width.

FURNACE ROOM INSTALLATION

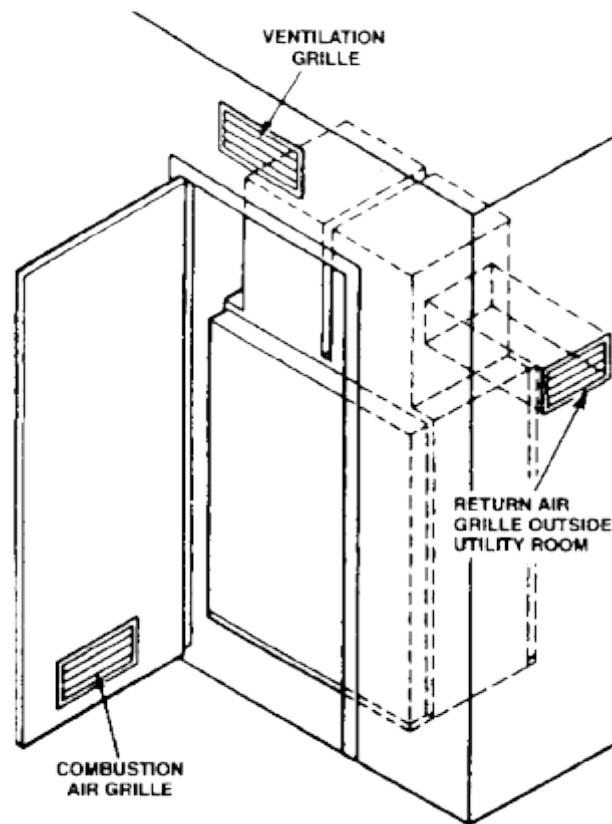


FIG. 28

FRESH AIR DUCT CAPACITIES

Fresh air duct capacities for duct supplying fresh air

BTU Per Hour Input*

SIZE	1/4" MESH SCREEN BTU	WOOD LOUVERS BTU	METAL LOUVERS BTU
3-1/4 X 12 INCH	144,000	36,000	108,000
8 INCH ROUND	200,000	50,000	150,000
8 X 12 INCH	382,000	96,000	288,000
8 X 16 INCH	512,000	128,000	384,000

* Based on opening covered by 1/4 inch mesh screen, wood or metal louvers.

Operating Instructions

OIL FIRING THE UNIT

To start the oil burner on a new installation

1. Check to make sure there is oil in the storage tank. No. 2 fuel oil may be used if tank is in the basement or buried below ground. No. 1 fuel oil is recommended if the tank is outside and above ground.
2. The oil burner was started and tested at the factory. Double check to make sure the proper oil burner nozzle is installed and electrodes are set according to the oil burner manual.
3. Turn oil tank valve lever to ON.
4. The furnace should be connected to a 110-Volt, 20 Amp circuit protector (fuse or circuit breaker.) Turn switch to "ON".
5. Set burner thermostat 10 degrees higher than room temperature. If the furnace is connected to the oil tank with a single line, air may have to be purged to the burner. (See burner manual). If there is no air in the oil line, the burner will start. If air is in the oil line, the cad cell will not see a flame and shut down. Wait 5 minutes and turn back on. The correct pump pressure of 100 psi was set at the factory. The draft regulator that is connected to the chimney pipe must be set a .03" Water Column negative to the chimney with the burner operating at least 5 minutes.
6. Refer to burner manual for service tips.

STARTING BURNER AFTER IGNITION FAILURE

Before proceeding, find the cause of ignition failure. It may be a plugged nozzle, dirty electric eye, soot on electrodes, air in the line, or plugged oil line. Do not attempt to restart burner when excess oil has accumulated or if the combustion chamber is very hot. Press the reset button on primary relay control and burner should start. Do not attempt this more than twice. If burner fails to operate, call a service technician.

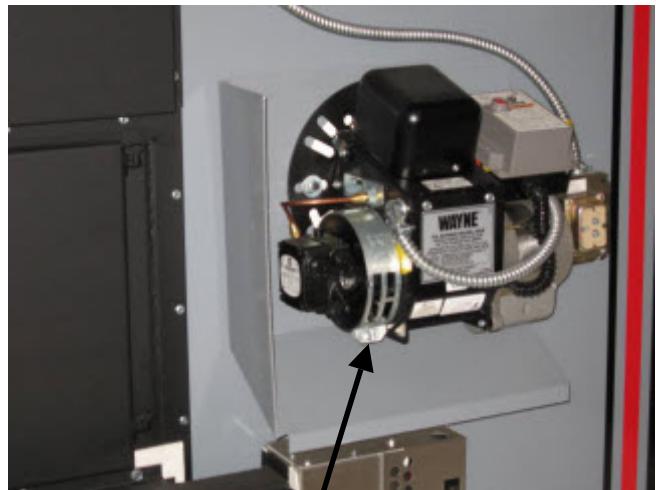


FIG. 29

WAYNE MODEL MSR
OIL BURNER

Operating Instructions

Gas Firing the Unit

To Start the Gas burner on new installation

1. With gas line in "off" position, install burner using gasket and tighten down with 3 nuts to furnace.
2. Connect 110 Volt power to burner
3. Connect 24 Volt power to the burner from the DS-103 Versatrol.
4. Set room thermostat 10 degrees above room temperature.
5. Allow burner to operate for 2 minutes until all air is purged from gas line.
6. Adjust burner air to allow red flame to enter wood combustion chamber about 6 inches.
7. Set the draft regulator on the chimney to .03" Water Column negative to the chimney with burner operating at least 5 minutes.
8. Gas burner air should be adjusted with CO-2 meter to insure maximum burner efficiency.
9. Refer to burner manual for service tips.

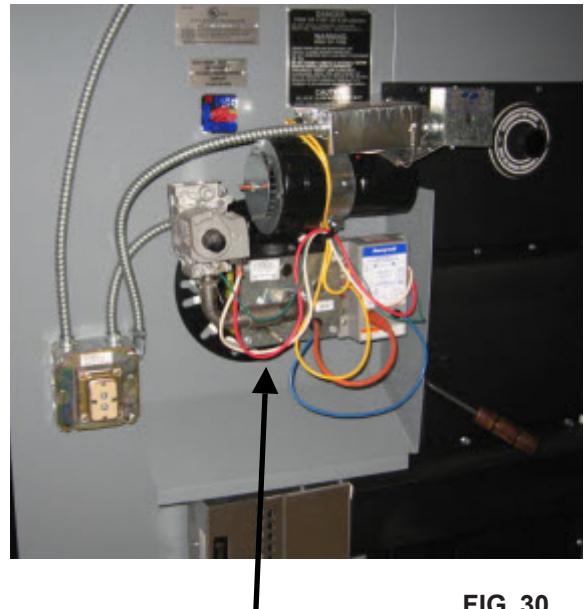


FIG. 30

WAYNE MODEL P250
GAS BURNER



Operating Instructions

BEST WOOD TO BURN

All solid fuel, whether it is coal, pine, oak or any grain has about 12,000 BTU's per pound if its moisture content is zero. Wood that has been cut, split and air dried for 2 years has about 8,000 usable BTU's per pound. Hardwood such as oak or hard maple has nearly twice the BTU's per cord as pine or aspen because it is nearly twice as heavy.

Freshly cut wood has about 50% moisture content. Wood that has been cut and split for 2 years has about 20%. Wood must reach at least 435° to ignite. High moisture content wood does not allow the gases in wood to get hot enough to provide complete combustion, thereby creating smoke and creosote, which is usable energy, but wasted because of incomplete combustion.

Yukon-Eagle furnaces are designed to wring the most energy possible from each log. Your furnace is designed to allow the primary air under the grate to create the initial burning. As the wood burns, gases, which contain 40% of the energy in the wood, escape to the top of the flame. The patented secondary air system (the round tubes between the firebrick) draws room air into the tubes and provides oxygen to the firebox to burn these gases. The result is you will use up to 75% less wood than stoves, furnaces or outdoor boilers without these features.

Type	Pound Weight per Cord	BTU's per Cord Air Dried Wood	Equivalent Value #2 Fuel Oil Gallons
White Pine	1800	17,000,000	120
Aspen	1900	17,500,000	125
Spruce	2100	18,000,000	130
Ash	2900	22,500,000	160
Tamarack	2500	24,000,000	170
Soft Maple	2500	24,000,000	170
Yellow Birch	3000	26,000,000	185
Red Oak	3250	27,000,000	195
Hard Maple	3000	29,000,000	200
Hickory	3600	30,500,000	215



FIG. 31



FIG. 32

Operating Instructions

STARTING WOOD FIRE WITH GAS OR OIL BURNER

Place three or four 6 to 8 inch diameter logs in the firebox. Set the temperature on the small thermostat to the desired setting. Set the temperature on the larger thermostat above room temperature. The flame from the burner need not touch the wood to ignite.

HAND FIRING WOOD

Set the small thermostat above room temperature. Set the larger thermostat below room temperature. The damper to the firebox should now be open.

Place paper and kindling in firebox as you would in a fireplace or campfire. Add logs to top of fire once kindling is burning. Reset small thermostat to desired room temperature.

Never leave ash drawer open, either to start fire or to provide more heat. The furnace is designed to provide adequate heat with the ash drawer closed.



WARNING: *Never operate furnace with ash drawer open. It could cause fire to burn at extreme temperatures, causing metal fatigue, firebox failure, and unsafe duct temperature.*



CAUTION: OVERLOADING WITH WOOD
Do not overload your furnace with wood. Failure or damage to the firebox could result. Never allow the hot coals to build up above the lower firebricks.



DANGER: *Never burn materials other than coal or wood logs, preferably split and dried. A chimney fire or heat exchanger failure could result. This includes large amounts of corrugated boxes, wood shavings, paper scraps, dried Christmas trees, coke, garbage, tires or other burnable products.*



FIG. 33



IMPORTANT: *Keep ash drawer empty. Primary air to the wood chamber travels under the grate. The grates will warp and eventually burn out if ashes are permitted to build up above them.*



CAUTION: RESTRICTED USE DURING ELECTRIC POWER FAILURE OR FURNACE FAN FAILURE

Furnace may be converted to a gravity system. The following directions must be followed carefully to avoid an over-fire situation.

1. Remove access door to blower compartment and remove air filter. Then replace access door. Keep ash drawer tightly closed. Do not tamper with wood primary air control. Load wood to half the recommended normal height, approximately 4 inches above grate.
2. Do not overload, no furnace fan is available to rapidly carry away the heat. Load small amounts of wood frequently until power is restored.
3. Open all air registers and remove all obstructions near them. Keep children away from air registers or burns could result.
4. Primary air damper and burner will operate automatically when electric power is restored.

Operating Instructions

WHAT SIZE COAL SHOULD I BURN?

The air space between the furnace grates is 1/2 inch. Therefore, coal smaller than 1/2 inch can fall through the grates into the ash pan.

- Pea size coal ranges from 9/16 to 11/16 inch.
- Nut size coal ranges from 1-3/16 to 1-5/8 inches.
- Stove size coal ranges from 1-5/8 to 2-7/16 inches.

Nut size is preferred by most people and is recommended for use in this furnace.

Anthracite coal is hard and burns like charcoal that is used in your barbecue grill. The coals must touch each other to ignite. Therefore, the smaller the coal, the easier to ignite. Stove coal is not likely to touch each other because of its size.

Bituminous coal is soft and not as desirable as hard coal. It creates dust when handled. It also produces large amounts of smoke and soot when burned at a slow rate. Soft coal from some areas of the country contains higher sulfur content. A large portion of it may be removed if the coal is cleaned.

HOW TO START A COAL FIRE

Place a small amount of crumpled paper and kindling wood on the ash-covered grates.

Ignite paper and after wood is burning briskly, cover with a thin layer of coal. As first layer of coal becomes ignited, add more coal gradually. Add coal until fire bed is built up to approximately 6 inches deep. As fresh coal is added always leave some of the glowing coal uncovered.

Draw the top red coals toward the front of the firebox. Pile the fresh coals toward the back.

The grates must be protected from direct contact with the fire. This is done by placing a layer of ash, one (1) or two (2) inches thick on grates. The ash left on the grate will help prevent overheating of the cast iron grates. It also keeps coal from falling through the grate's opening.

MAINTAINING A COAL FIRE

Bituminous coal should be built into a cone shape once the fire has started. When re firing, break up the cone a little using a poker. Especially if it has caked over to form a crust. Be careful not to mix the coal as this increases the chance of forming clinkers.



FIG. 34

Western lignite coal should be burned the same way you would burn wood. (Refer to wood burning instruction on previous pages.)

SHAKING THE GRATES

Shaking a fire should only be done if room is needed for fresh coal. Also, if the ash accumulation on the grates is excessive. Generally, the grates need only be shaken once or twice a day.

Shake the grates using a few short strokes. Stop when the first red coals appear in the ash pan. Under-shaking restricts the amount of air that reaches the fire. Over-shaking may cause the fire to go out.

CAUTION: Do not use kerosene, gasoline, thinners, etc. to start a coal fire.

A coal fire should never be poked or broken up. This causes ash to come to the surface of the coal bed. The ash may fuse into lumps or clinkers which interfere with proper burning.

Anthracite Coal - To bank the fire for the night, pile the coal higher to the back of the firebox. Allow it to slope toward the fire box door. Always leave some red or burning coals uncovered in the front of the firebox.

Bituminous Coal - To bank fire for the night, shake the fire and add coal, forming the center cone. Allow enough time for the volatiles to burn off before closing the fire door.

Operating Instructions

OPERATING INSTRUCTIONS FOR BURNING COAL ON 1/2-INCH OPENING GRATES (*Optional*)

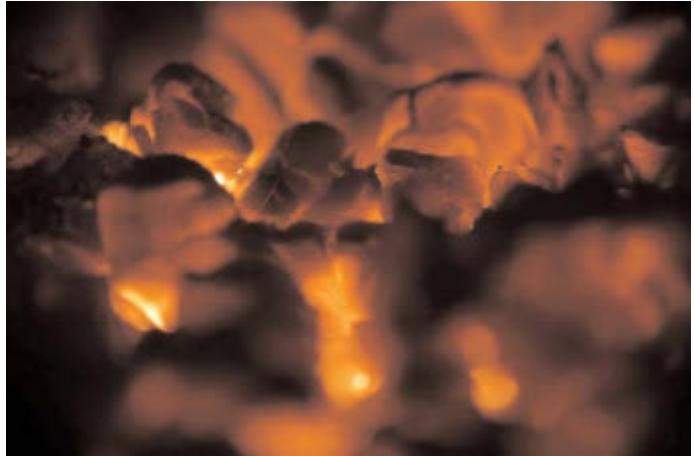
The following instructions are for burning various types of coal, storage of coal, and the cleaning of the furnace.

Some coal is oil-treated at the mine. Some users have indicated that it tends to make the coal difficult to start.

Burning coal requires some patience and a regular procedure. With improper tending, a coal fire can go out in a short time. Once the fire starts to go out, it is almost impossible to reverse.

After a coal fire goes out, the coal must be removed from furnace. Then the starting process can be repeated.

Our coal burning instructions are general, as coal comes in various sizes and types. Anthracite coal is most recommended as it burns with little smoke when burning properly.



CAUTION: Burn Anthracite, Bituminous, or Lignite coals only. DO NOT BURN Petroleum, Coke, or Cannel Coals.

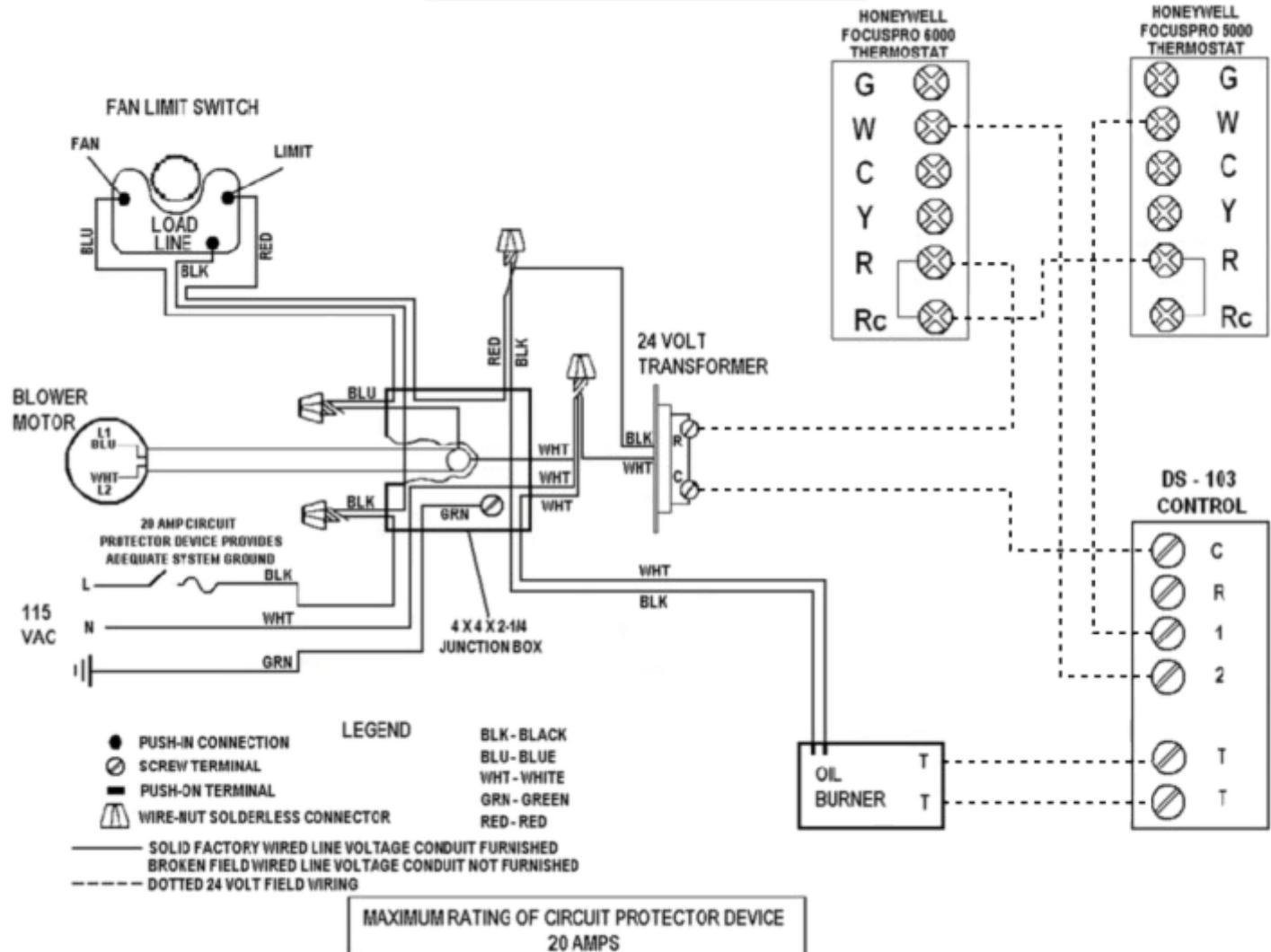
IGNITION TEMPERATURE OF COAL AND WOOD

How hot does coal have to get to ignite? Following are examples of the ignition points of various materials:

- Paper ignites @: 350°F
- Wood ignites @: 435°F
- Western lignite ignites @: 630°F
- Low volatile bituminous ignites @: 765°F
- High volatile bituminous ignites @: 870°F
- Anthracite coal ignites @: 925°F

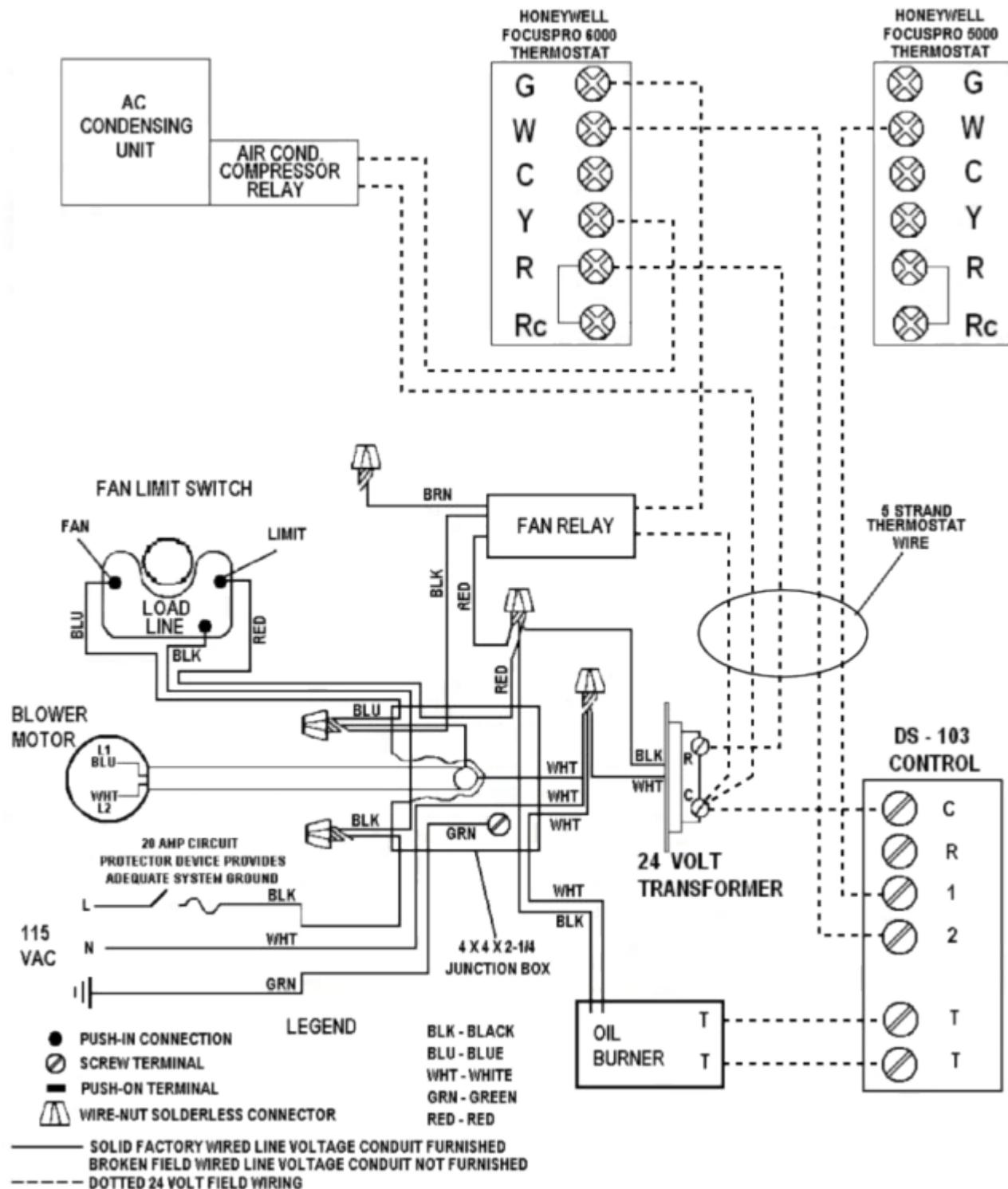
Wiring Diagrams

OIL AND WOOD HEATING ONLY



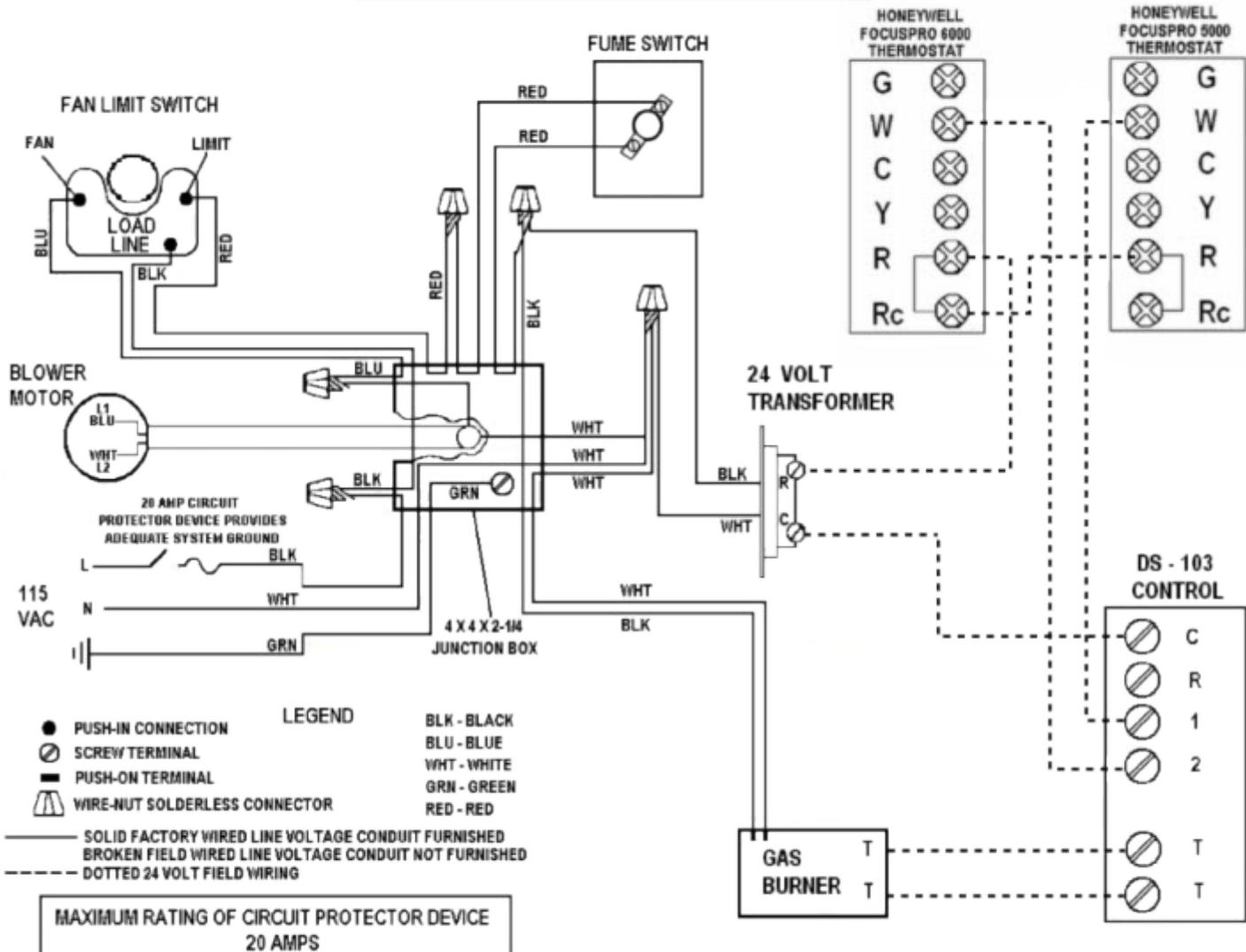
Wiring Diagrams

OIL AND WOOD HEATING WITH A/C



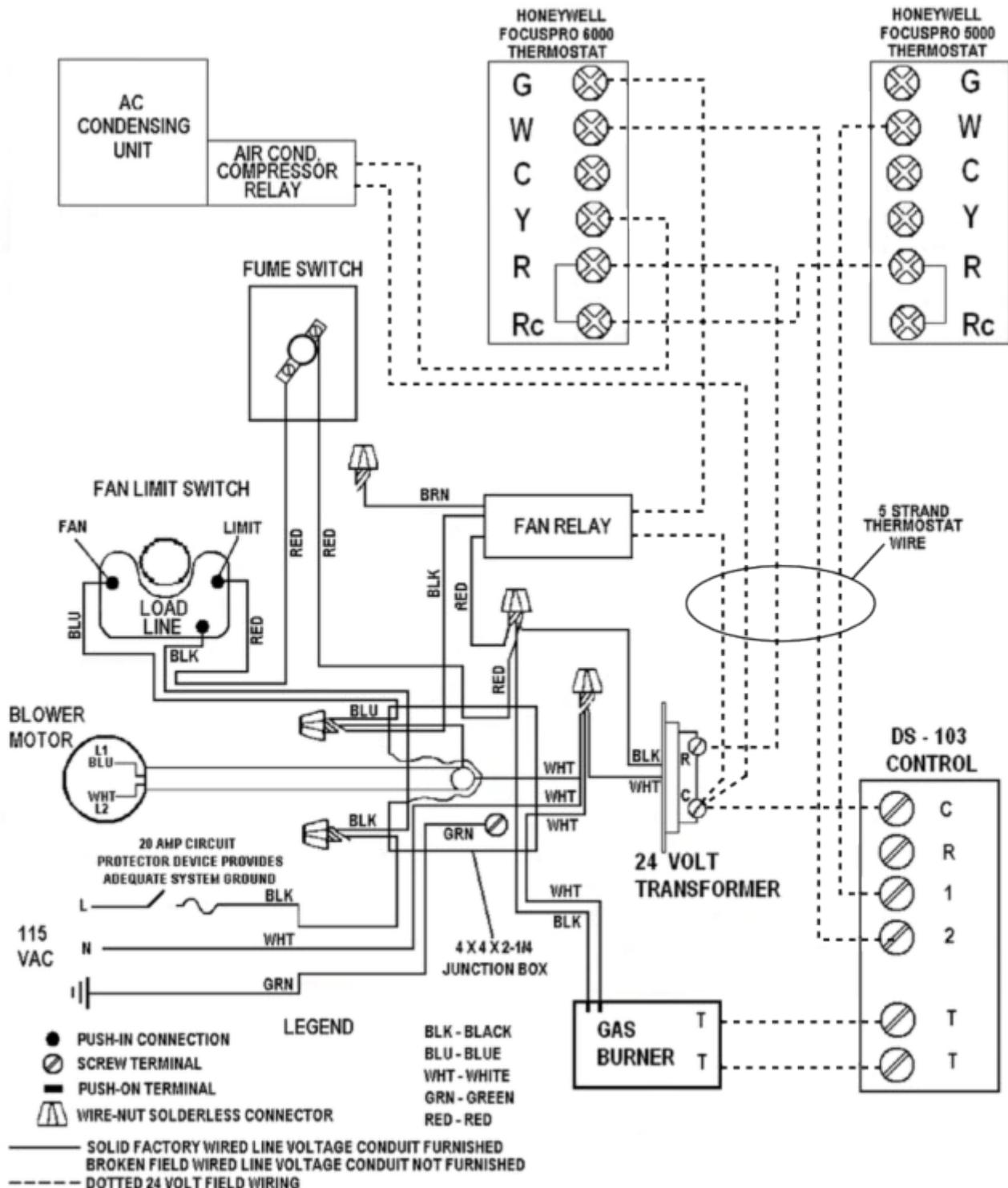
Wiring Diagrams

GAS AND WOOD HEATING ONLY



Wiring Diagrams

GAS AND WOOD HEATING WITH A/C



Maintenance

GRATE CARE -ASH REMOVAL

It is necessary that ashes be removed from the ash pan on a daily basis. The ashes should never be allowed to accumulate high enough to come in contact with the grates. Such a condition could cut off necessary air circulation. It could also result in a warping or burnout of grates.

ASH DISPOSAL

Unlike wood ashes, coal ash should not be spread on the garden. The minerals in coal ash contains several chemicals which could be harmful to plant life.

RECOVERING UNBURNED COAL

Screen coal ashes through a piece of 1/4 inch or 3/8 inch mesh hardware cloth. This helps recover any unburned coal that has fallen through grates.

STORAGE OF COAL

Coal may be stored indoors or outdoors, with some precautions:

1. The storage area must be free of materials that are easily burned. Examples are paper, wood, rags, and leaves.
2. Wetting and drying of coal should be avoided. Outside storage's should be protected from rain or snow. Wet coal should not be piled on dry coal.
3. Locate the storage area in a place that is 75° F or lower.
4. Nut coal weighs approximately 58 lbs. per cu. ft. A storage bin 4-feet square by 4-feet high will hold 2 tons.



FIG. 35

IMPORTANT:

Never smother fire when adding fresh coal.

Maintenance

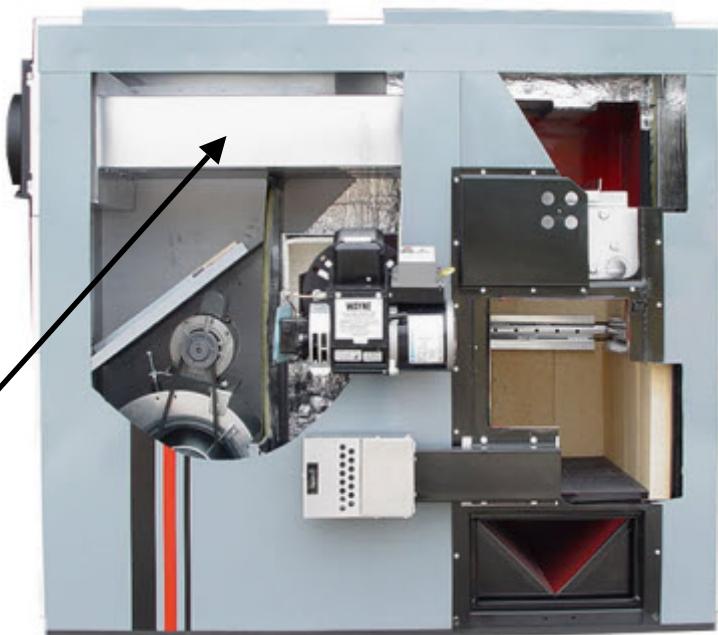
SMOKE PIPE, CHIMNEY AND SECONDARY HEAT EXCHANGER

Do not burn green or freshly felled wood. This may cause creosote and soot to build up in chimney, smoke pipe, and secondary heat exchanger. These should be checked and cleaned several times each heating season.

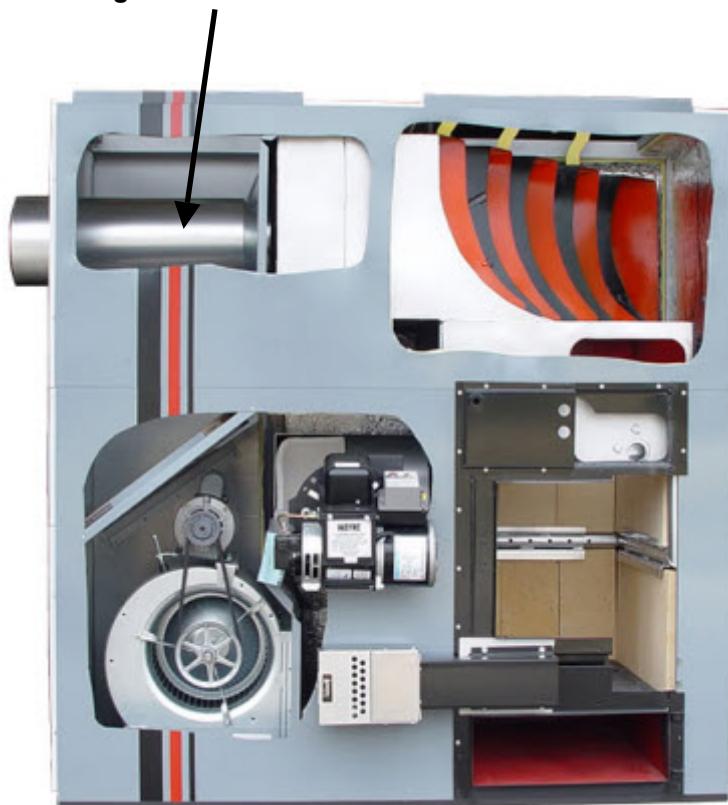
CLEANING FURNACE AND CHIMNEY FLUE PIPES

Frequently check and clean the furnace flue pipes and chimney. Soot and fly ash should not be allowed to build up on any of these surfaces. Chimneys are best cleaned professionally.

**Secondary Heat Exchanger
Eagle I - Husky**



**Secondary Heat Exchanger
Eagle II - Polar**



Maintenance

FURNACE BLOWER ADJUSTMENT

Set adjustable motor pulley so blower will give approximately 80-90° F temperature rise through furnace. After pulley has been adjusted check bolt as follows:

The belt is drawn tight during shipment. Therefore both belt tension and sheave alignment must be rechecked by the installer. This is done when the furnace is placed in service.

Improper belt tension and pulley misalignment are the major causes of furnace fan noise. It also causes failure of belts and bearings.

Sheave alignment is determined with a straight edge held across outer face of fan sheave. The face of motor sheave should be parallel to the straight edge at all points. See Figs. 36-38

Proper belt tension is more difficult to determine accurately. Too little tension will permit slippage causing belt wear. It may cause noise or squealing when the motor starts. Excessive tension increases motor load. It may cause the oil film between shaft and bearing to fail. This, in turn, causes the bearing to seize or burn out.

The proper belt tension is the minimum which will drive the blower without slippage. This varies with sheave diameter, fan size, and motor starting torque characteristics. The practical belt tension can best be determined by actual experience. When in doubt it is better to have the belt too loose rather than too tight. Belt tension can be judged by grasping the belt as shown. The belt should be deflected approximately one inch, without the motor moving, when moderate pressure is applied. See Fig. 39

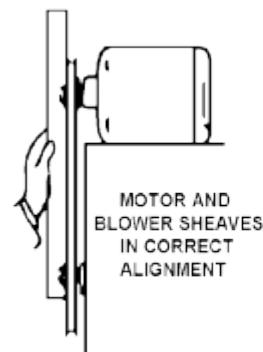


FIG. 36

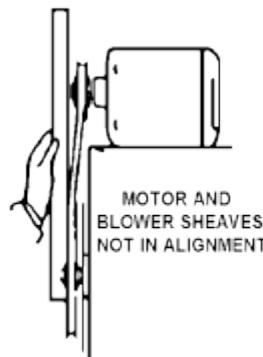


FIG. 37

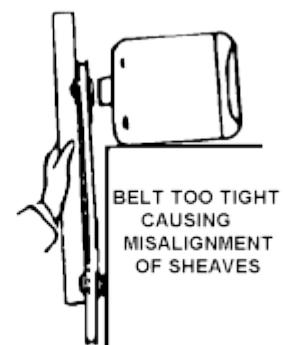


FIG. 38

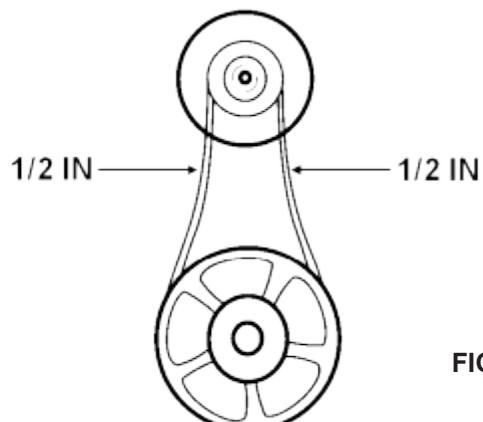


FIG. 39

Maintenance

DUCT WORK AND BLOWER SPEED ADJUSTMENT

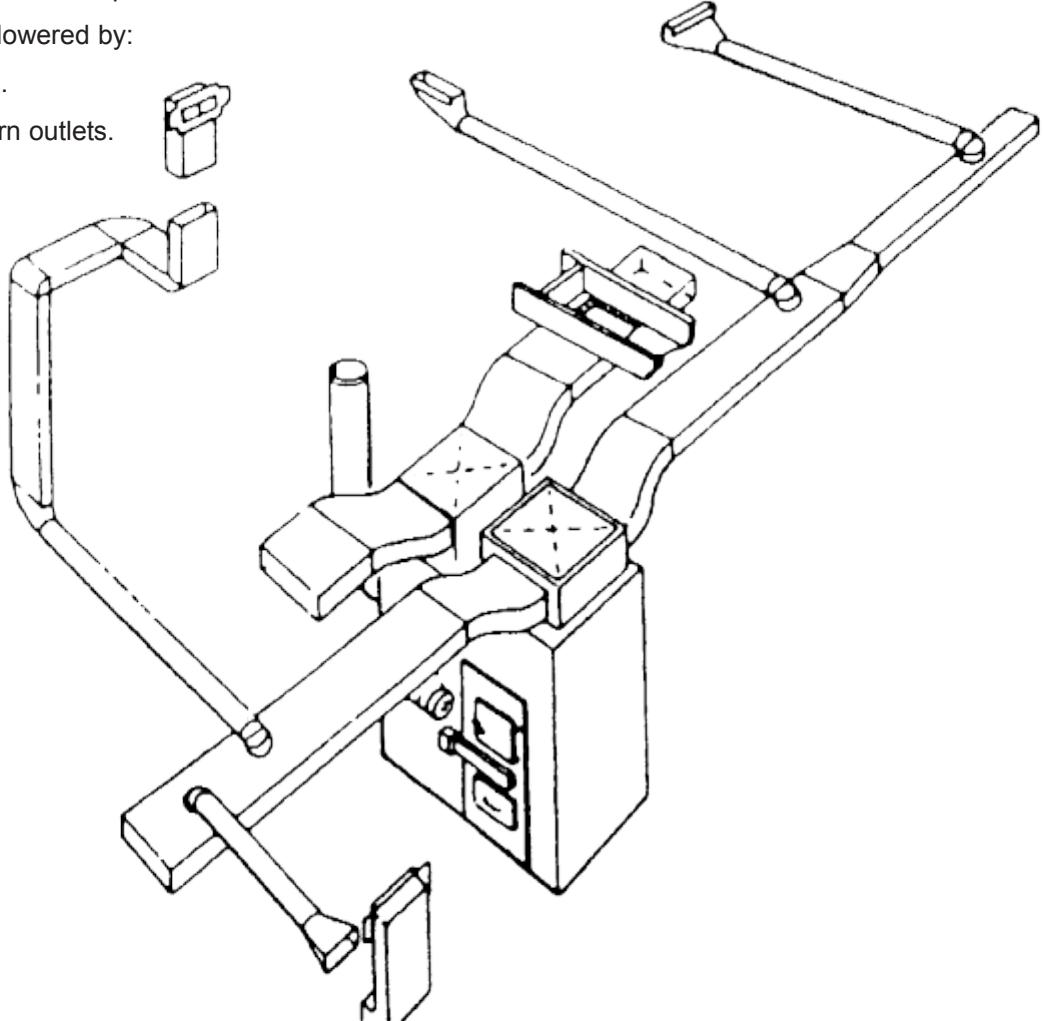
Supply and return duct system should be sized properly for efficient operation. Normal air temperature rise through the furnace should be adjusted to approximately 80-90° F. Proper blower speed adjustment, in conjunction with adequate duct work are necessary to achieve this.

A high temperature rise will result in excessive fuel usage. This is due to the high stack temperature that always accompanies a high air temperature rise. It can also cause premature heat exchanger failure.

To perform temperature rise check, start furnace and let it run a minimum of 10 minutes. (Be sure all duct work is complete and furnace is in its normal operating condition). Place #1 thermometer in the return duct near the furnace. Place #2 thermometer in the supply duct near the furnace, but not in the plenum. After 10 minutes or more operation, take thermometer readings. Supply air temperature should be no more than 80-90° higher than return air temperature.

Air temperature rise can be lowered by:

1. Increasing blower speed.
2. Additional supply or return outlets.
3. Lowering firing rate.



Questions? Visit www.yukon-eagle.com or call 1-800-358-0060

Maintenance

TESTING INSTALLATIONS FOR EFFICIENCY

A Draft gauge must be used. Draft in smoke pipe must be set at .03 Water Column updraft. Failure to set properly will cause fuel to be wasted, heating will not be satisfactory, fast buildup of creosote in heat exchanger and chimney may occur and cause damage to your heating system.

The draft regulator will afford the user maximum fuel efficiency, however, the finest draft regulator in the world cannot increase the efficiency of a heating system if the system as well as the regulator is not in proper adjustment.

Basically, stack temperature and percentage of CO₂ are a measure of stack losses for any fuel. Therefore, many of the basic principles can be and should be applied to oil-fired furnaces as well as for those burning solid fuels.

In preparation for these tests, the following should be checked. The Draft Regulator installed should be:

- plumb and level
- in the same room as the unit
- on the side of a vertical, sloping or horizontal smoke pipe
- located close to the furnace

Drill two holes approximately 1/4 inch in diameter in the flue pipe between the outlet from the furnace and the Draft Control.

Insert a stack thermometer in one of the holes and leave it there continually during the test so that you can refer to it at any time. See Fig. 40



FIG. 40

Maintenance

TEST PROCEDURE

Step 1.

Set the thermostat high enough so that the unit will run for at least 15 minutes, the maximum time that should be required for the test. Let the unit operate enough for the stack temperature to stabilize.

Step 2.

For your initial set of readings, set the Draft Regulator so that there is .03 Water Column Draft in the smoke pipe between the flue outlet and draft regulator. A manometer must be used to properly set the draft to .03" WC.

Step 3.

Insert the sampling tube of the CO₂ tester in the hole that you have drilled adjacent to the stack thermometer and find the percentage of CO₂ in the sample of the products of combustion. Follow the instructions of the manufacturer of the instrument you are using.

Step 4.

Use efficiency finder chart or stack loss slide rule to determine efficiency. Be sure to subtract room temperature from stack thermometer reading and use this net stack temperature for determining the efficiency.

Step 5.

Insert end of smoke tester into same hole as was used to test for CO₂ and perform the smoke test.

Step 6.

The filter paper from the smoke test, when compared to the standard, must be determined and be found to be satisfactory. It should never be greater than #2, preferably #1 or zero, depending on local requirements or your own service standard.

Repeat steps 3, 4, and 5 as needed, adjusting the air shutter on the burner and draft regulator until you obtain the highest possible efficiency. It is desirable to have a high CO₂ reading and low stack temperature with a minimum smoke reading.

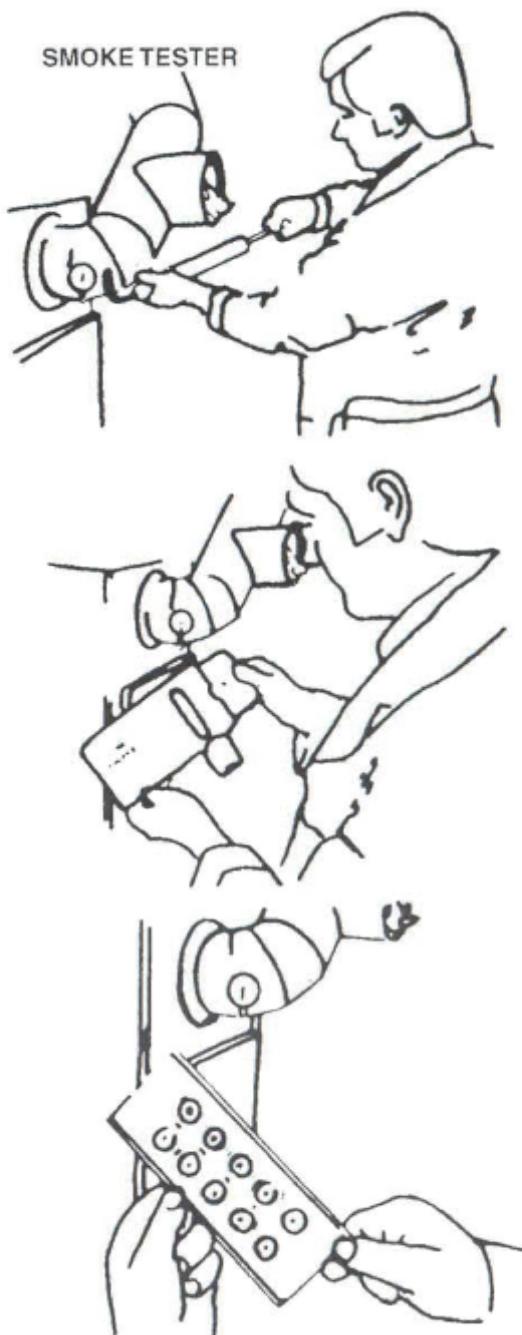


FIG. 41

Maintenance

FIREBRICK PLACEMENT

Models (LWO-112 & LWG-112 ONLY) (Fig. 42)

Lower Row

1. Place 3 ea. 12"x 6" bricks at rear of firebox
2. Place 4 ea. 12"x 6" bricks on side opposite burner.
3. Place 4 ea. 9" x 6" bricks on burner side.

Upper Row

1. Place 2 ea. 9" x 6" bricks at rear of firebox.
The 9- inch side lying down.
2. Place 1 ea. 9" x 6" and 1 ea. 12"x6" bricks on side opposite burner. The 9-inch and 12-inch side lying down.
3. Install grates last (wide side up).

FIREBRICK PLACEMENT

Models (LWO-168 & LWG-168 ONLY) (Fig. 43)

Lower Row

1. Place 3 ea. 12" x 6" brick at rear of firebox.
2. Place 4 ea. 12" x 6" brick on side opposite burner.
3. Place 4 ea. 12" x 6" brick on burner side.

Upper Row

1. Place 3 ea. 9" x 6" brick at rear of firebox
2. Place 3 ea. 9" x 6" and 1 ea. 4-1/2 x 9 brick on side opposite burner.
3. Install grates last (wide side up).

**Model LWO-112 & LWG-112
(Left Hand Model Shown)**

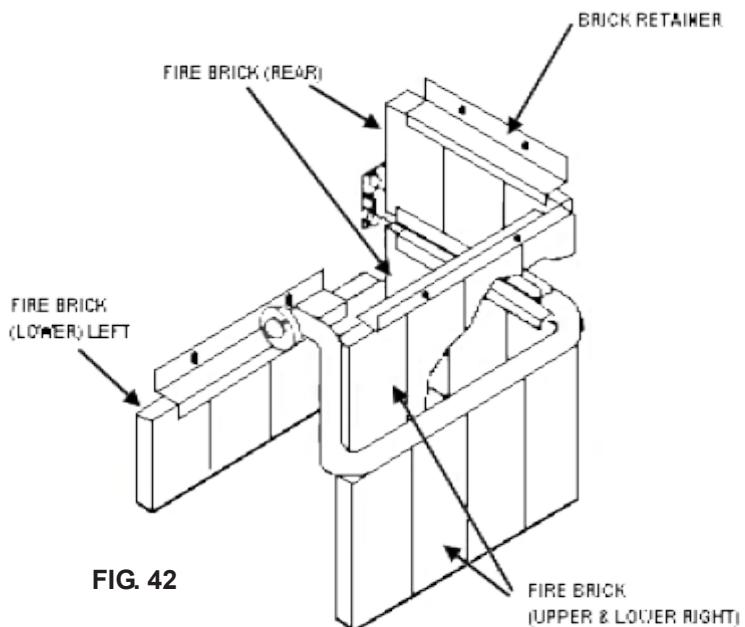


FIG. 42

**Model LWO-168 & LWG-168
(Left Hand Model Shown)**

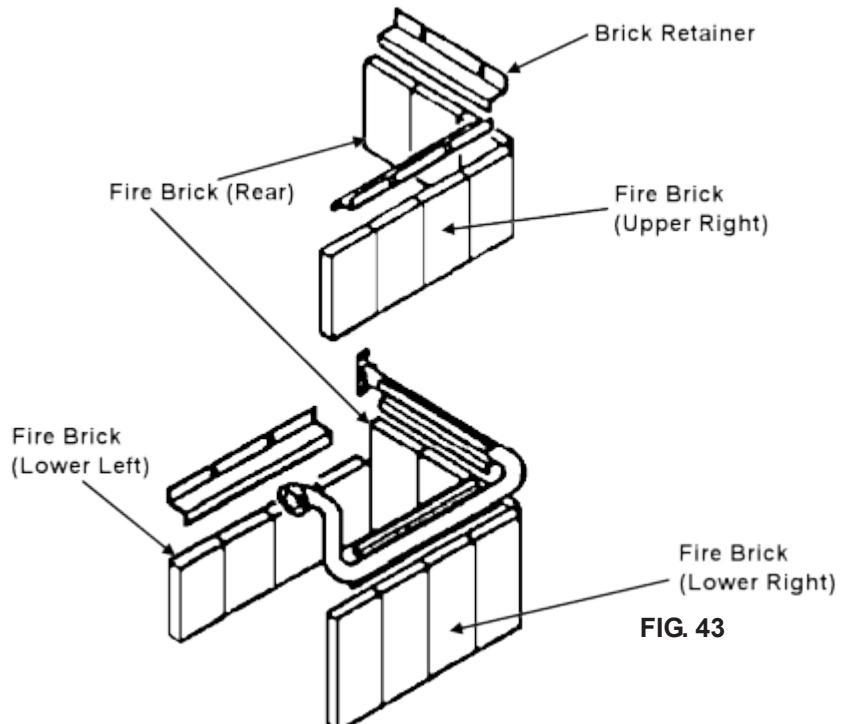


FIG. 43

Maintenance

OIL BURNER MAINTENANCE

MAINTENANCE AT THE END OF THE HEATING SEASON:

1. Shut off electric current to burner at fuse panel.
2. If oil filter has not been cleaned recently, it should be removed and cleaned. (Consult instruction card furnished with fuel unit).
3. Oil storage tank should be kept filled to prevent water vapor from collecting. It is suggested the valve in the suction line be closed. Oil storage tank should be cleaned every 2 or 3 years. This is to remove any sediment or water that has collected in tank.

MAINTENANCE AT THE START OF THE HEATING SEASON:

1. It is advisable to have a service technician inspect and service your burner.
2. Heating plant, smoke pipe and chimney should be cleaned and checked for repairs.
3. It is advisable to have the entire electrical system inspected before putting the burner into operation. This is due to it standing idle for the summer months. This should include primary relay, limit control, thermostat.

Check the electrodes for carbon and cracks in insulators. Also check for corrosion on all terminals of the electrodes and transformer.

AIR FILTER MAINTENANCE:

Check and clean monthly. Change filter at least twice a year.

BLOWER MOTOR MAINTENANCE:

If motor has oil caps, oil twice yearly.

CAUTION:

The furnace has a high efficiency "fiber-type refractory" combustion chamber. Normal servicing of this unit does not require cleaning of the combustion chamber. Use EXTREME caution if it becomes necessary to work in the area of the combustion chamber. This pyrolite chamber should be checked monthly. Replace if damaged or worn.



FIG. 44

GUN ASSEMBLY ADJUSTMENT

The gun assembly can be adjusted in the slot of the fan housing. This is done by loosening the screw holding the slot cover in position. Adjust nozzle tip so it is located 7/8" behind the front face of the burner cone.



FIG. 45

Maintenance

HOW TO PREVENT RUST AND CORROSION

At the end of each heating season, clean both primary and secondary heat exchangers. Also, clean the ash pan thoroughly. Paint the inside of the heat exchanger with automobile crankcase oil. This will decrease rusting caused by summer moisture.

The black paint on firing door area may wear or burn off. It can be repainted with a high temperature, flat black, air-drying paint.

CLEANING THE CHIMNEY, SMOKE PIPE AND HEAT EXCHANGER

Avoid chimney fires. On a regular schedule, check for creosote and soot buildup in chimney, smoke pipe, and heat exchanger. They must be kept clean. Keep a professional chimney sweep in mind if you have access to one.

Steel brushes are the safest for cleaning metal surfaces. Salt solutions and some chemicals may damage metal surfaces. Do not over fire your furnace. Do not burn anything that combusts in seconds. Excessive fuel temperatures may result, thereby igniting creosote.

To clean the chimney, obtain a stiff brush with an extendible handle. Then insert the brush into chimney from the top. Continue the brushing and sweeping downward until entire length of chimney is cleaned.

After cleaning chimney, debris will be at the bottom of chimney at the clean-out opening. Open clean-out door and sweep debris into a metal container.

The smoke pipe, from furnace to chimney, can be cleaned with an 8-inch diameter brush. A smaller brush can also be used.

For cleaning the secondary heat exchanger you can use a steel brush. Use a 4 x 6" brush for the Eagle I - Husky and a 3 x 8" brush for the Eagle II - Polar, with a flexible steel handle. The primary heat exchanger can be cleaned with any steel brush. A furnace vacuum cleaner may be used.

NOTE: *Soot will act as an insulator which causes less heat to be transferred into your duct system. It also causes more heat out your chimney. Both reduce the efficiency of the wood and fuel being burned.*



CAUTION: *Before cleaning chimney, smoke pipe, and furnace, turn electrical power off to furnace and other appliances connected to chimney. Be sure wood fire is out and inside of furnace is cool.*



CAUTION: *In case of chimney fire, call the fire department immediately!*



CAUTION: *Extinguish the fire in the furnace. Do this by setting the thermostats all the way down to close the primary air damper and oil burner. Empty fire chamber and ash pan into safe, fireproof container.*

NOTE: *Do not use your furnace until a professional inspection has been made. They should inspect your furnace, smoke pipe and chimney.*

DISPOSAL OF ASHES

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground. Place the container well away from all combustible materials, pending final disposal. Ashes can be disposed of by burial in soil or otherwise locally dispersed. First, the ashes should be retained in the container until all cinders have thoroughly cooled.

CREOSOTE-FORMATION AND NEED FOR REMOVAL

When wood is burned slowly, it produces tar and other organic vapors. This combines with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire.

The chimney connector and chimney should be inspected at least twice monthly during the heating season. This is to determine if a creosote buildup has occurred.

If creosote has accumulated it should be removed to reduce the risk of a chimney fire.

Maintenance

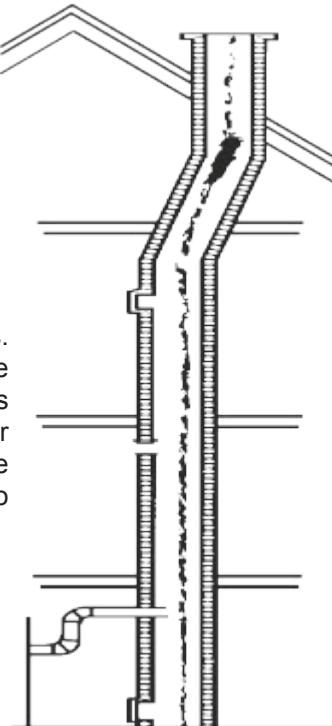
SMOKE IN THE FURNACE ROOM

This condition is usually caused because smoke is not being drawn up through the chimney. Other causes could be a failed (firebox)heat exchanger. Check with your qualified furnace service provider.

Chimney causes:

1. Fresh air for combustion must be supplied to the furnace room.
2. Cold chimney. Warm air rises and cool air falls. Outside chimneys are cold, which can cause downdrafts until the chimney heats up. This usually happens in the spring and fall of the year when outdoor temperatures are mild. These temperatures do not produce enough heat to warm the chimney up.
3. Chimney not tall enough. It must terminate at least 2 feet above the peak of the roof.
4. A downdraft can occur when the wind blows. This happens when your home is in a valley or high trees are near your home. Also, if your house is on the east side of a hill or mountain. One solution is to add a chimney cap with a weather vane. This often will turn a downdraft into an updraft. Another solution is to add height to your chimney. Another solution is to add a power ventor to the smoke pipe. The power ventor operates when the thermostat is calling for wood heat.
5. The barometric draft control must be set at .03.

If set less, the chimney may not draw. If set higher, the wood fire may draw too much combustion air. This causes the room temperature to exceed the thermostat setting.



TOP OF CHIMNEY LOWER THAN SURROUNDING OBJECTS
REMEDY: EXTEND CHIMNEY ABOVE ALL OBJECTS WITHIN 30 FEET.

CHIMNEY CAP PUSHED OVER FLUE OR FLUE OBSTRUCTED BY A VENTILATOR
REMEDY: REMOVE OBSTRUCTION

ACCUMULATION OF SOOT OR DEBRIS IN OFFSET
REMEDY: REMOVE

AIR LEAKS THROUGH CRACKS IN FLUE AND CHIMNEY DISCLOSED BY SMOKE TEST
REMEDY: CLOSE LEAKS WITH CEMENT

FLUE CAP RUSTY AND LEAKY
REMEDY: CLOSE LEAKS

VENT PIPE PUSHED INTO FLUE
REMEDY: MAKE END FLUSH WITH INSIDE OF FLUE

LOOSELY FITTED VENT PIPE DISCLOSED BY SMOKE TEST
REMEDY: CLOSE WITH CEMENT

LOOSELY FITTED CLEAN OUT DOOR DISCLOSED BY SMOKE TEST
REMEDY: CLOSE LEAKS WITH CEMENT

OPENING BETWEEN FLUES DISCLOSED BY SMOKE TEST
REMEDY: CLOSE OPENINGS

TO MAKE A SMOKE TEST, USE A SPECIAL SMOKE BOMB AND WITH TOP OF CHIMNEY CLOSED, LOOK FOR LEAKS.

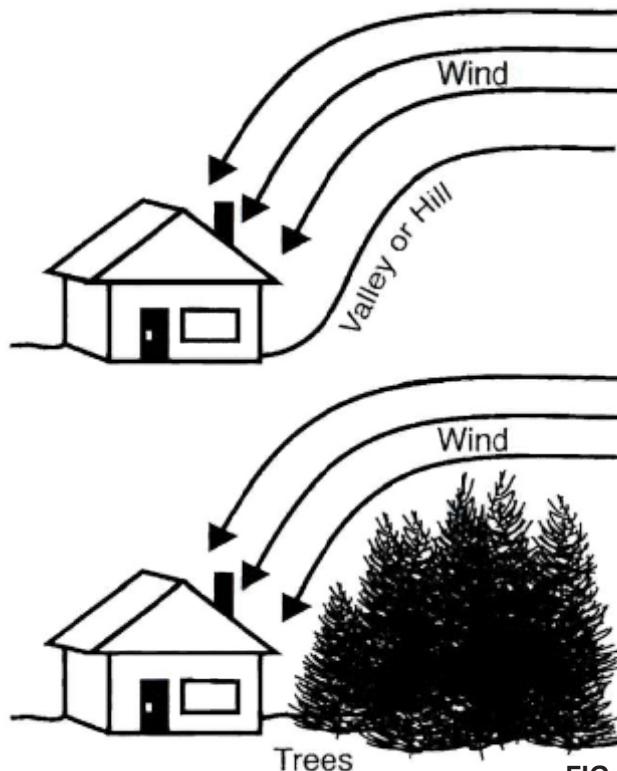


FIG. 46

Maintenance

OVER HEATING WHEN BURNING SOLID FUEL AS YOUR PRIMARY SOURCE OF HEAT

If your home is overheating, your furnace is providing heat when the thermostat is satisfied. One of these ideas will help with overheating.

1. The best answer is to use fewer logs at each filling. This provides the maximum amount of heat while conserving wood.
2. There are 3 pegs in the fan and limit control. One peg is set at 250° F. Never change this setting. The middle peg is set at 150° F. This is the temperature setting that the air circulating fan starts. You may want to set this setting at 160° F or higher. The bottom peg is set at 120° F. Reset this peg to 130° F or higher. These new settings will not allow the fan to run as much. This reduces the amount of air provided to the rooms.

NOTE: You will not have continuity of operation if you make adjustments to fan and limit control. This means that your air circulation blower may not operate continually when burning oil or gas.

3. You may feel that the furnace is oversized for your requirements. If this is the case cover part of the grate with a piece of heavy metal. This will retard the fire. This will cause some creosote buildup in firebox and chimney because it will not burn as clean.

GAS OR OIL PART OF FURNACE TOO LARGE FOR THE HOME

You or your furnace service provider may feel the furnace BTU input is too large or too high. This will cause the gas or oil blower to not operate continually when burning oil or gas. BTU input can be reduced to as little as 75,000 BTU input. Choosing this option will require adjusting the air circulation blower to a lower speed. This assures continuity of operation. Slowing the blower down will allow the blower to run continually. This occurs when the thermostat is calling for heat from the gas or oil burner.

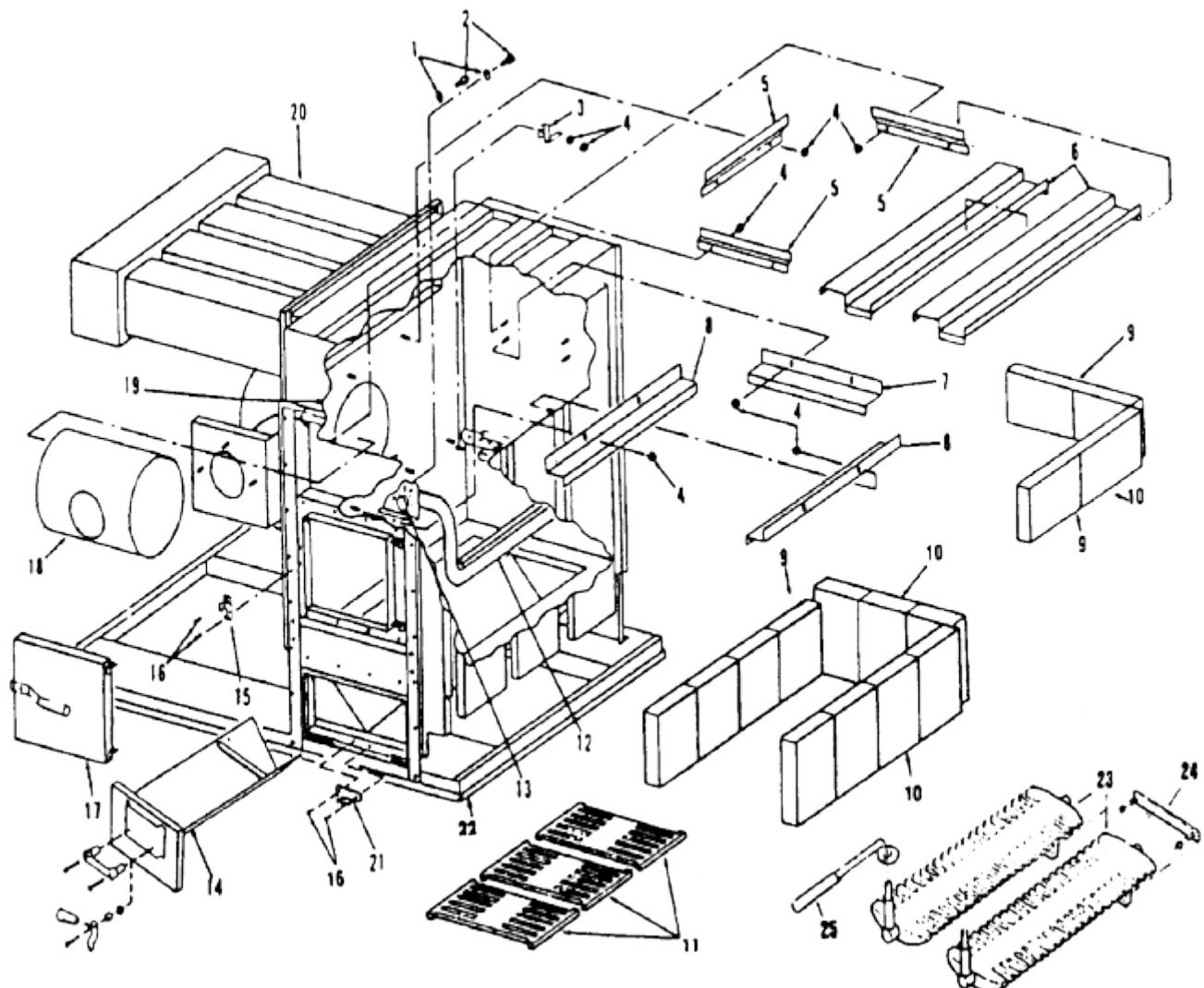


IMPORTANT: During normal operation, firing door and ash drawer must be kept tightly closed. Air leakage will cause loss of efficiency resulting in higher heating costs. If door gaskets become worn, replace with 1/2" fiberglass rope available from local sources.

NOTE: The damper will automatically close if there is an electric power failure. This can occur from high limit cut-off or electrical power outage. This will prevent heat exchanger damage.

Exploded Views & Parts List

EAGLE I - HUSKY MODELS LWO-112 & LWG-112



Exploded Views & Parts List

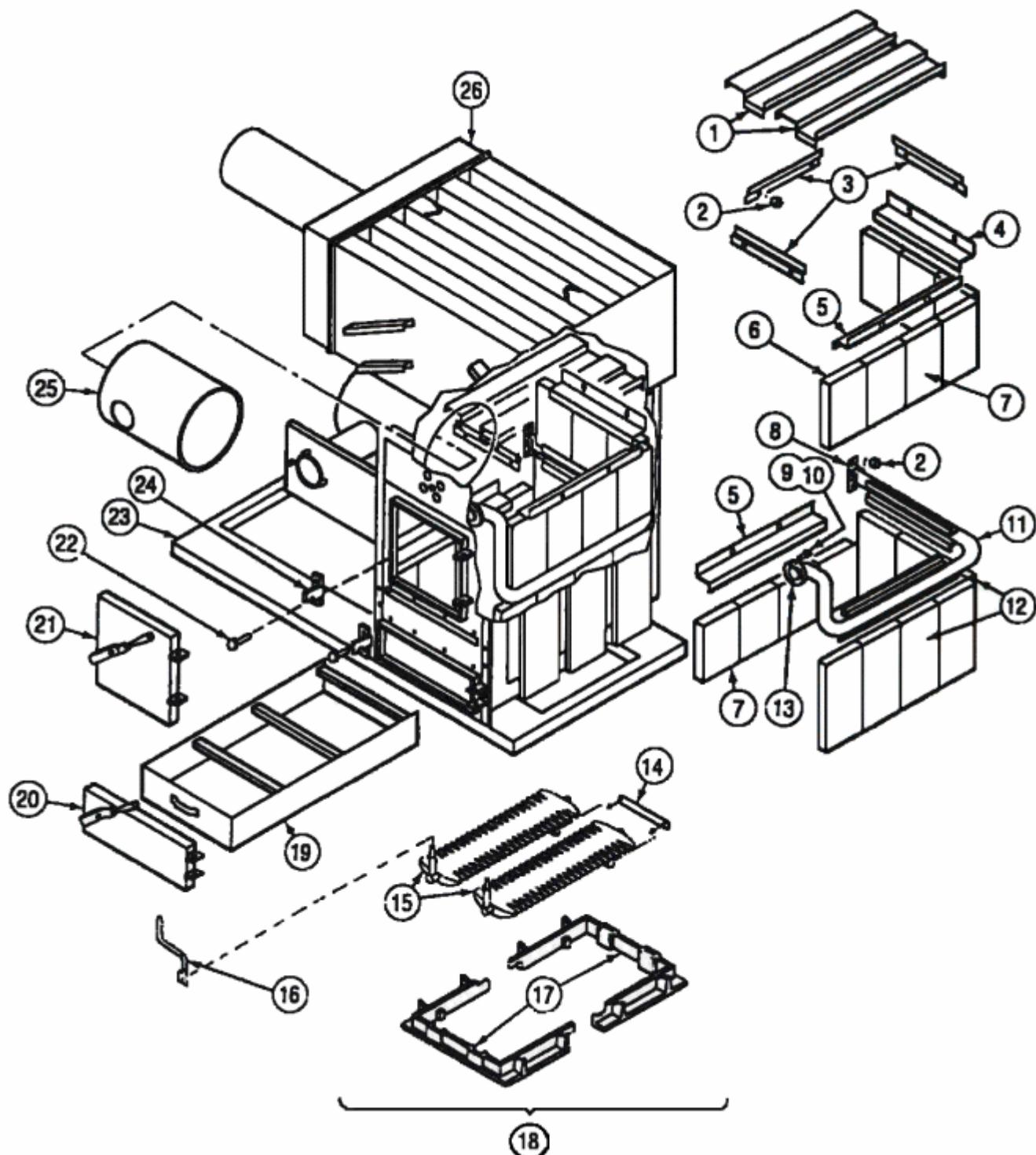
REPAIR PARTS-Combustion Chamber Assembly (Left Hand Shown) EAGLE I- HUSKY OIL/GAS-SOLID FUEL COMBINATION FURNACE

Models LWO-112 and LWG-112

Key No.	Left Hand	Right Hand	Description
1	10110500	10110500	Fender Washer 5/16 I.D. x 1-inch O.D. (2 Req.)
2	10104900	10104900	Screw Thread Cutting Hex Washed HD 1/4 20 x 3/4 (2 Req)
3	20106300	20106300	Bracket Tube Support
4	10105300	10105300	Nut Hex 1/4-30 (14 Req.)
5	20102200	20102200	Bracket, Baffle (3 Req.)
6	20105900	20105900	Baffle, Smoke (2 Req.)
7	20102640	20102640	Top Brick Retainer, Rear
8	20102650	20102650	Top Brick Retainer, Side (2 Req.)
9	10100700	10100700	Fire Brick 9 x 6 x 2-inch (7 Req.)
10	10116200	10116200	Fire Brick 12 x 6 x 2-inch (8 Req.)
11	10100900	10100900	Grate, 3/4-inch Cast Iron 15-3/4 x 7-7/8 (3 Req.)
12	20105100	21105100	Air Tube, Secondary
13	10110700	10110700	Gasket, Secondary Air Tube
14	20107503	20107503	Pan, Ash
15	20105703	20105703	Latch, Door
16	10105000	10105000	Screw, Machine Rd HD 1/4-20 x 3/4 (4Req.)
17	20104903	20104903	Fire Door Assembly
18	10100601	10100601	Liner, Refractory POT-10-inch O.D. x 10-inch
19	20105803	21105803	Firebox
20	20201904	20201904	Secondary Heat Exchanger
21	20107003	20107003	Latch, Ash Pan
22	20300603	21300603	Base
	20200700	20200700	Nut Retainer-Top & Bottom (22 1/2-inch (2 Req.)
	20200790	20200790	Nut Retainer-Side (7 3/4-inch (2Req.)
	10103800	10103800	Gasket, Heat Exchanger 68-inch
	10106100	10106100	Washer 1/2 X 20 SAE (16 Req.)
	10104800	10104800	Screw Thread Cutting Hex Washer HD 1/4-20 x 1-inch (16 Req.)
	10103990	10103990	Gasket, Ash Pan 1/2 Thermo cord 42
	10123200		Coal Grate Assembly
23	10122400		Coal Grate (2 Req.)
24	20108400		Connecting Rod Assembly (Includes 2 Locknuts)
	10122500		Grate Frame (2 Req.)
25	10122900		Coal Grate, Handle
Not Shown	20109500	20109500	Pot Liner Ring (Stainless Steel)

Exploded Views & Parts List

EAGLE II - POLAR MODELS LWO-168 & LWG-168



Exploded Views & Parts List

(Left Hand Shown)

EAGLE II - POLAR OIL/ GAS-SOLID FUEL COMBINATION FURNACE

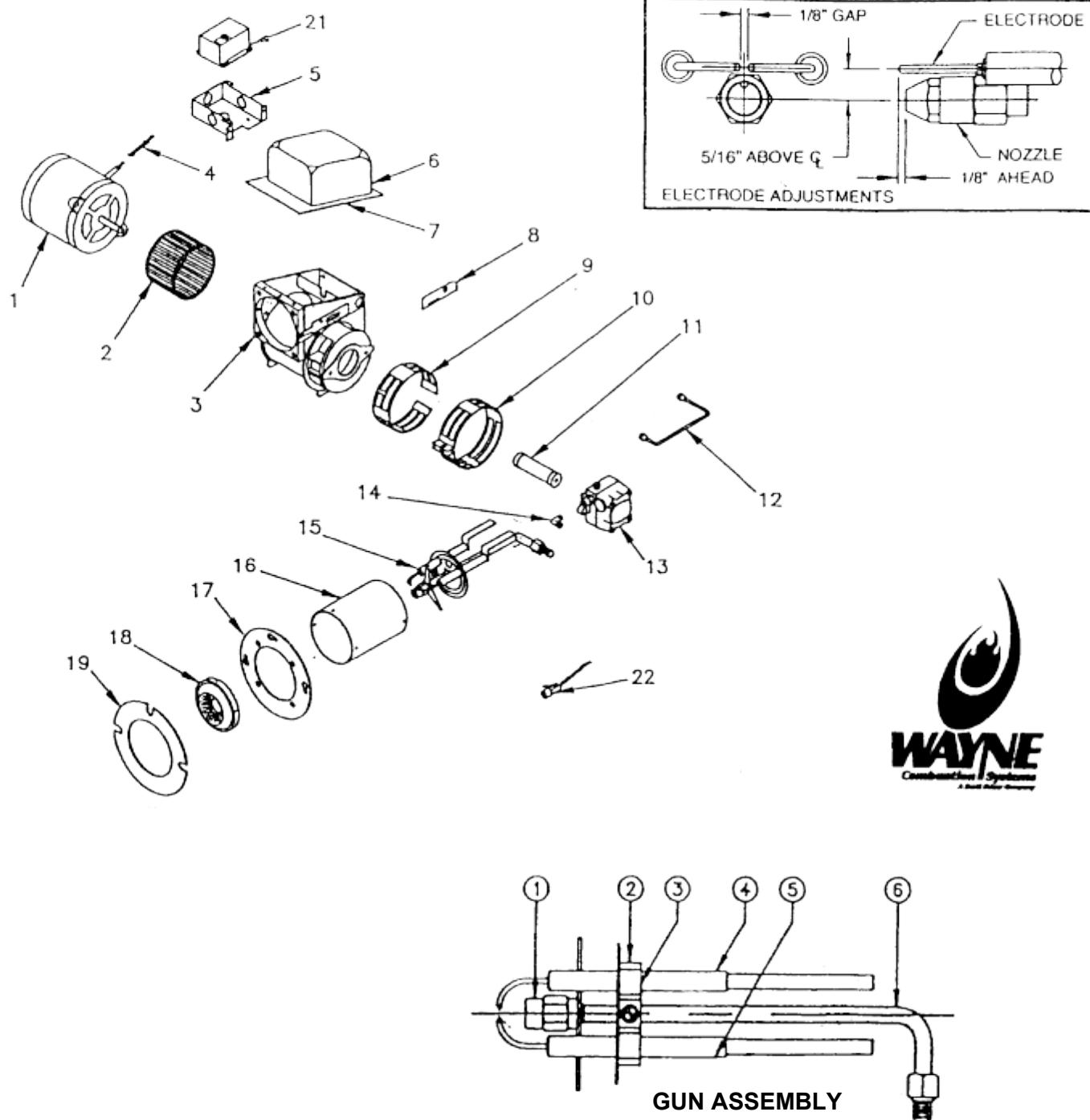
Models LWO-168 and LWG-168

Key No.	Left Hand	Right Hand	Part Description
1	20105900	20105900	Smoke Baffle (2 Req.)
2	10105300	10105300	Hex Nut 1/4-20 (14 Req.)
3	20102200	20102200	Bracket, Baffle (3 Req.)
4	20102640	20102640	Top Brick Retainer, Rear
5	20102650	20102650	Top Brick Retainer, Side (2 Req.)
6	10100800	10100800	Fire Brick 9 x 4-1/2 x 2-inch (1 Req.)
7	10100700	10100700	Fire Brick 9 x 6 x 2-inch (10 Req.)
8	20106300	20106300	Bracket, Tube Support
9	10110500	10100500	Fender Washer, 5/16-inch I.D. x 1-inch O.D. (2 Req.)
10	10104900	10104900	Screw Thread Cutting Hex Washer HD 1/4 20 x 3/4 inch (2 Req.)
11	50105320	51105320	Secondary Air Tube Weldment
12	10116200	10116200	Fire Brick 12 x 6 x 2 inch (7 Req.)
13	10110700	10110700	Gasket, Secondary Air Tube
14	20108400	20108400	Connecting Rod Assembly** (Including two 5/16-Inch Locknuts)
15	10122400	10122400	Coal Grate** (2 Req.)
16	10122900	10122900	Coal Grate Handle**
17	10123990	10123990	Goal Grate Frame** (2 Req.)
18	10124500	10124500	Coal Shaker Grate Assembly Complete** (includes items 14,15,16,17)
19	50105503	50105503	Ash Pan Weldment
20	50106603	50106603	Ash Door Assembly
21	50104303	50104303	Fire Door Assembly
22	10105000	10105000	Screw, Machine, Rd. Hd..1/4-20x3/4-in. (4 Req.)
23	50300700	51300700	Base Weldment
24	10139700	10139700	Door Latch (2 Req.)
25	10100602	10100602	Refractory Pot Liner
26	50105403	50105403	Combustion Chamber Weldment
*	10901500	10901500	3 x 8-inch Steel Flue Brush
*	10100950	10100950	Wood Grates, Standard (3 Req.)

* Not Illustrated/ ** Optional

Exploded Views & Parts List

WAYNE MODEL MSR OIL BURNER



Questions? Visit www.yukon-eagle.com or call 1-800-358-0060

Exploded Views & Parts List

BURNER COMPONENTS WAYNE MODEL MSR

PART DESCRIPTION AND PART NUMBER WHEN ORDERING PARTS

NO.	Part Description	Part NO.
1	Motor, 1/7 HP 120/60/3450 1.7A PSC	23000-002
2	Blower Wheel 3.12" WX 4.25" OD	20673
3	Burner Housing	21718-001
4	Motor Cord Cover	Not Used
5	J-Box	21319
6	Transformer	23101-M
7	Housing Cover	21723-002
8	Slot Cover Plate	13392
9	Inner Air Band	20601-002
10	Outer Air Band	20622-002
11	Coupling	13424
12	Oil Line Assembly	14451
13	Fuel Unit	13495
14	Elbow	13494
15	Gun Assembly	31760-008
16	Air Tube 8.75" SR	21864-043
17	Flange	20640-002
18	Air Cone (1A)	14157
19	Gasket	12484
20	Nozzle (Not Shown) 1.00 80* A	14456-100
21	Relay Wayne 15 Sec	101266-001
22	Cad Cell (15")	14289

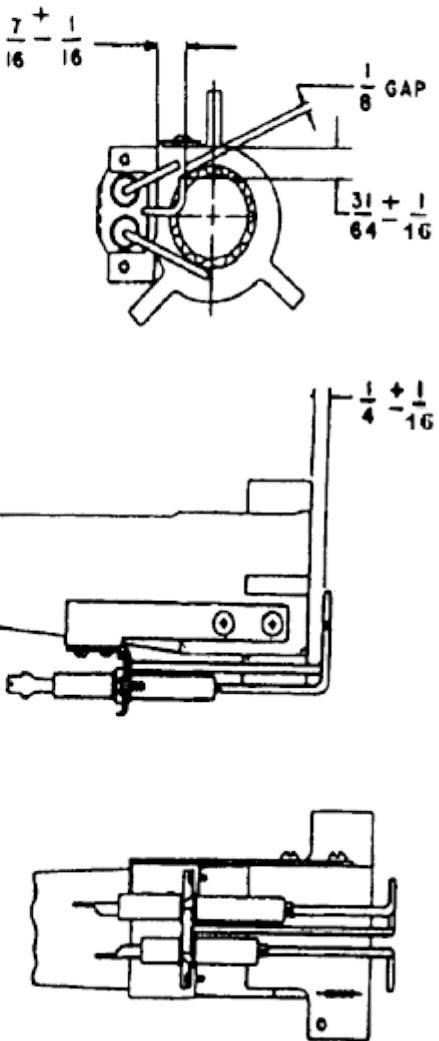
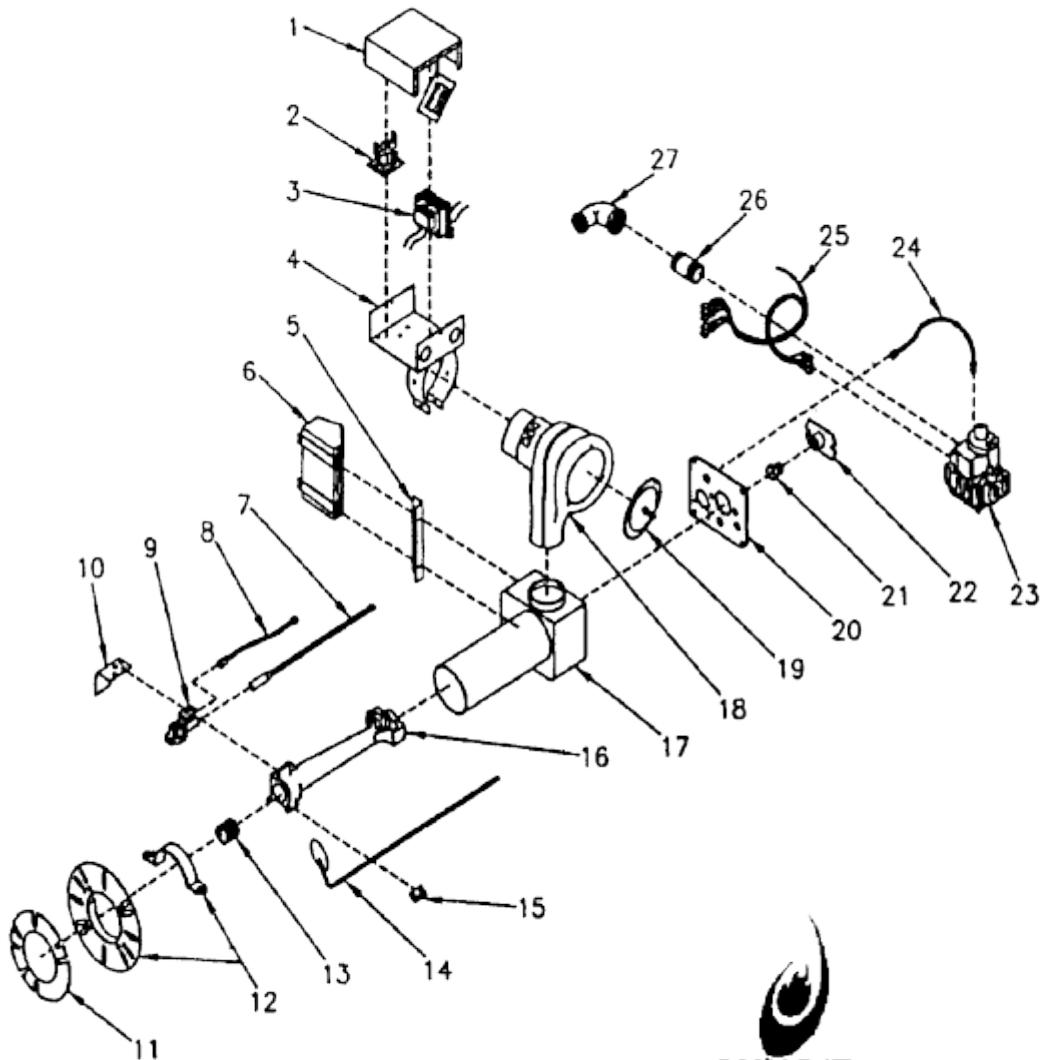
MSR GUN ASSEMBLY DETAIL

1	Nozzle Adaptor	21913-SER
2	Electrode Support Assembly	21923-001
	Disc, Static 3"/3.69" Dia 60"	13430
	Screw, HXSLTF 4-40 x .375"	100603-028
3	Electrode Clamp	100675-001
4	Electrode Assembly (RH)	100634-014
5	Electrode Assembly (LH)	100635-014
6	N/A Must order gun assembly	

Exploded Views & Parts List

WAYNE MODEL P250AF-DIN GAS BURNER

P250AF DIRECT SPARK ELECTRODE LOCATION



Exploded Views & Parts List

BURNER COMPONENTS WAYNE MODEL P250AF-DIN

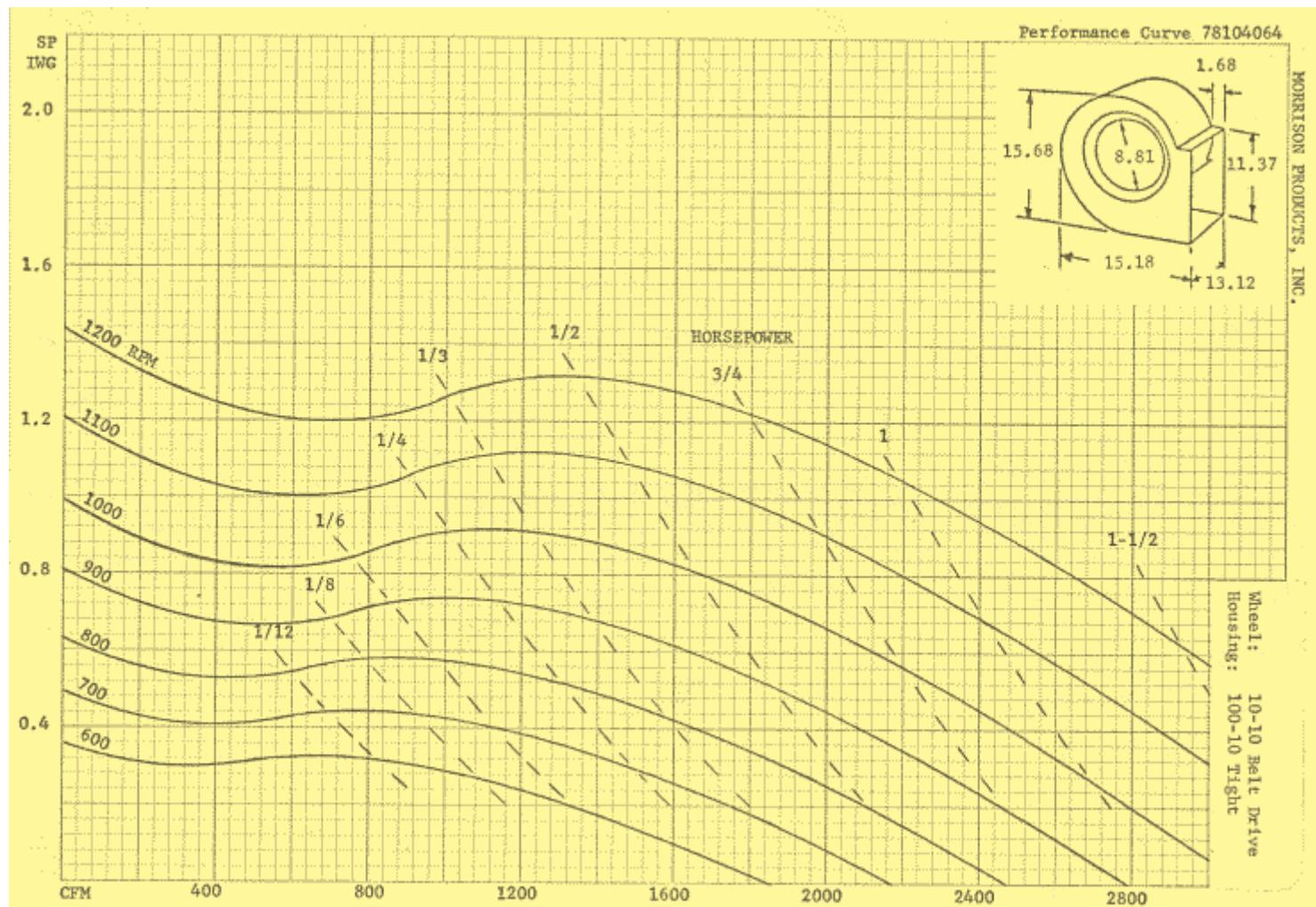
PART DESCRIPTION AND PART NUMBER WHEN ORDERING PARTS

Key No.	Part Description	Part Number
1	Control Box Cover ASM	62899
2	Time Delay Relay	100983-002
3	Transformer 24V/30VA	60186-004
4	Control Box/Strap ASM	62903-001
5	Bracket	62700-001
6	Ignition Module H-S8751008 DI	101243-001
7	Ignition Wire ASM	62947-003
8	Tube	N/A
9	Electrode ASM	62261
10	Pilot Shield	N/A
11	Gasket	12484
12	Adjustable Flange (Incl. #11)	21724-011
13	Flame Retention ASM	60748
14	Flame Spreader ASM	61818
15	Flame Spreader Bracket	61840
*	Air Shutter Disk	61770-002
*	Electrode Bracket	62556-002
16	Venturi-P250AF	61817
17	Air Tube/Housing/ W-Ext.	62287
18	Motor/Blower ASM	60172-002
19	Air Shutter ASM	62510-SER
20	Housing Coverplate ASM	62049-002
21	Orifice 7/32" (.219")/5.56MM-NAT	62286
	Orifice #29 (.136")/3/45MM-LP	61828
22	Orifice Holder	62898-001
23	Gas Valve-H-VR8305M 4801	62374-004
24	Tube	N/A
25	Wiring Harness	63375-001
26	Nipple	60564
27	Elbow	60152
28	Coupling-Not Shown	60014
29	Conversion Kit, N-LP-NOt Shown	62672-004
*	Gun Assembly	31760-008

Exploded Views & Parts List

CIRCULATING FAN PERFORMANCE CURVE CHART

MODELS LWO-112 AND LWG-112

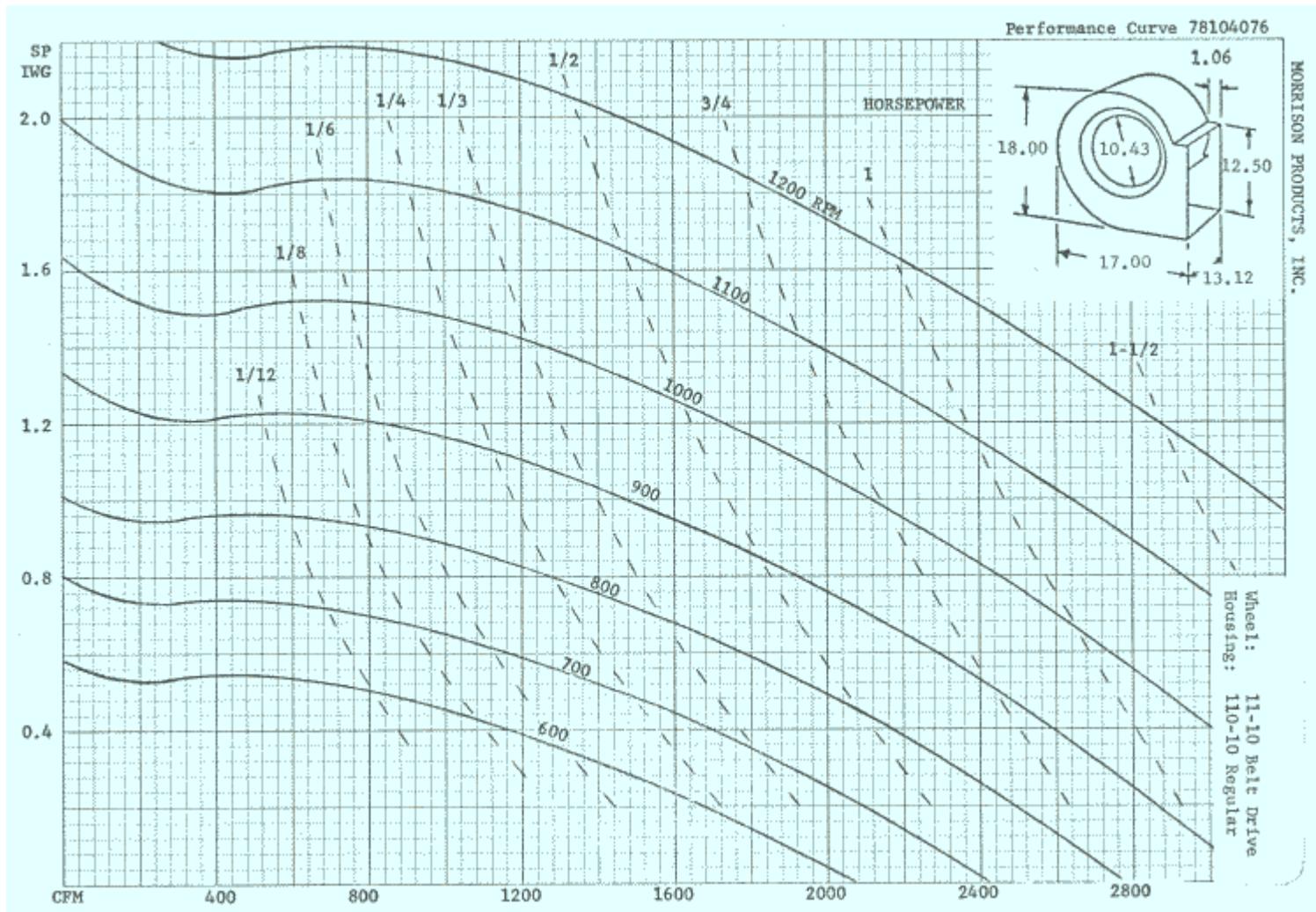


THIS CIRCULATING FAN PERFORMANCE CURVE
CHART IS FOR DETERMINING
MOTOR HORSEPOWER NEEDS

Exploded Views & Parts List

CIRCULATING FAN PERFORMANCE CURVE CHART

MODELS LWO-168 AND LWG-168



Troubleshooting

SERVICE HINTS- OIL

Problem: If your furnace is not heating or giving enough heat.

Cause: Thermostat is not set correctly	Correction: Check to see that thermostat is set on "HEAT" position and heat anticipator is set properly. Reset thermostat above room temperature.
Cause: Burner is not firing properly	Correction: Contact your local service man
Cause: No power to furnace	Correction: Check fuse or circuit breaker. If fuse is blown, replace. IF breaker is tripped, reset. Check to be sure shut-off switch is "ON".
Cause: No oil in tank	Correction: Check oil tank gauge. If empty, have tank filled and start burner.
Cause: Valve in oil line is closed	Correction: Open valve in oil line and start burner
Cause: Oil filter is plugged	Correction: Replace filter cartridge
Cause: Cycling on limit control	Correction: Check to see limit control pointer is set against stop at 250° F. Clean or replace air filter if dirty. Check to be sure all registers and grilles are open and not disturbed.

SERVICE HINTS-GAS

What's Wrong?	WHY?
Lockout occurs 3-10 seconds after ignition	<ul style="list-style-type: none"> • Reverse polarity. • System improperly grounded • Gas pressure too high, causing flame to lift off burner. • Sensor probe incorrectly positioned in flame pattern.
Flame not established	<ul style="list-style-type: none"> • Spark gap too small
Arcing to ground	<ul style="list-style-type: none"> • Spark too large
Weak spark	<ul style="list-style-type: none"> • Broken high voltage lead. • High voltage lead too close to metal surface.
No flame	<ul style="list-style-type: none"> • Valve malfunction.
Low flame current and/or nuisance lockouts	<ul style="list-style-type: none"> • Electrode improperly placed.
Nuisance lockouts	<ul style="list-style-type: none"> • Flame current falls below 2.5 A. • Low gas pressure.

Problem: If you do not seem to be getting enough air circulation....

Cause: Air filter is dirty	Correction: Clean or replace air filter as necessary
Cause: Registers and grilles are obstructed	Correction: Check supply or damper positions. Check registers and grilles to make sure they are not closed. Also, make sure they are not obstructed by carpet, draperies or furniture. Remove any obstructions.

Notes

Model Number: _____ Serial Number: _____

Installation Date: _____ Contractor _____

Service Calls: _____

Notes:

YUKON EAGLE

OWNER'S MANUAL

- Assembly
- Installation
- Operation
- Repair Parts

For Model's
LWO-112 (Oil Fired)
LWG-112 (Gas Fired)
LWO-168 (Oil Fired)
LWG-168 (Gas Fired)

CAUTION:
Read Rules And
Instructions
Carefully For
Safe Operation

IMPORTANT:

Installation must be made in accordance with state and local ordinances which may differ from this installation manual.

**YUKON-EAGLE I - HUSKY
YUKON-EAGLE II - POLAR**

OIL/WOOD - GAS/WOOD

**WARM AIR CENTRAL
HEATING FURNACES**

HOW TO ORDER REPAIR PARTS

**WHEN ORDERING REPAIR PARTS,
ALWAYS GIVE THE FOLLOWING INFORMATION:**

- PART NUMBER
- PART DESCRIPTION
- MODEL NUMBER

**ALL PARTS MAY BE PURCHASED FROM A
YUKON DEALER OR DIRECT FROM OUR
FACTORY.**

PHONE: 1-800-358-0060
FAX: 1-800-440-1994
E-MAIL: sales@yukon-eagle.com
WEBSITE: www.yukon-eagle.com